sams

modular hi-fi components

MHF-36

for

Bell & Howell 3600

Bradford 1404B40 (WTG53553)

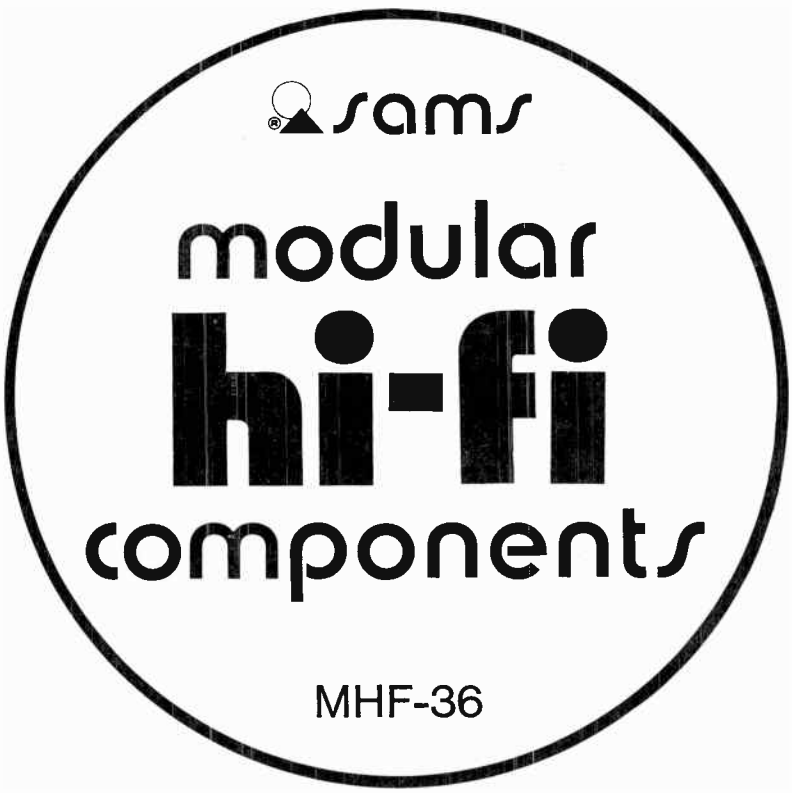
Electrohome SC421 (H19-201), SC430 (H19-202)

Emerson 31M25, 31M25B — Hitachi SR-800

Morse/Electrophonic R-13, RC-13 — Olympic CS843, CS844, CS845, CST850 — Panasonic SA-6200

Penncrest 1760 — RCA YZD572W — Sony TA-1144

$3.95
$4.95 IN CANADA
Cat. No. MHF-36



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HOWARD W. SAMS & CO., INC.
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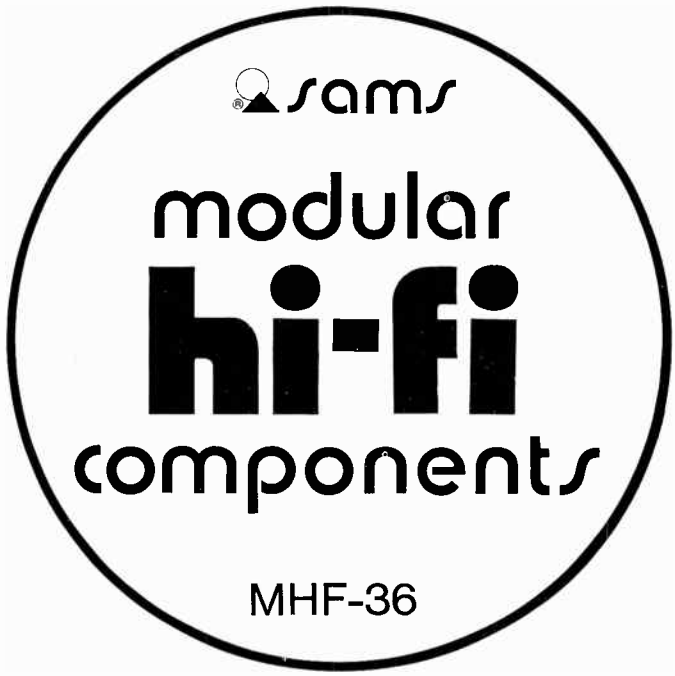

Library of Congress Catalog Card Number 72-77606

modular **hi-fi** components

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GENERAL SERVICING INFORMATION

The following information applies to all players in this volume, and should be followed before any adjustments are made or trouble diagnosis is attempted. Any exceptions or additions will be found in the detailed servicing procedures for each player.

POWER SOURCES

Many players require full supply voltage for proper operation. Be sure the supply voltage is maintained at the rated value under load while making adjustments.

CLEANING

Head faces should be cleaned with head cleaner to remove dust and accumulated oxide. (An applicator may be fashioned from absorbent cotton.) Do not use a screwdriver or any metallic object near the head faces.

CAUTION: *Avoid getting head cleaner on any plastic surface.*

Clean capstans, pressure rollers, and tape guides with alcohol using a soft lint-free cloth. Also use alcohol to remove oil and grease from drive belts and other driving surfaces.

LUBRICATING

Clean all surfaces before lubricating. Apply a few drops of #20 machine oil to all bearings and rotating bushings. Apply a thin film of light, nonhardening grease to all cam surfaces and pawls, if they have been factory lubricated. Always wipe excess oil or grease from parts that have been lubricated.

CAUTION: *Oil and grease must be kept off all driving surfaces as well as any parts which may transfer oil or grease to them.*

DEMAGNETIZING

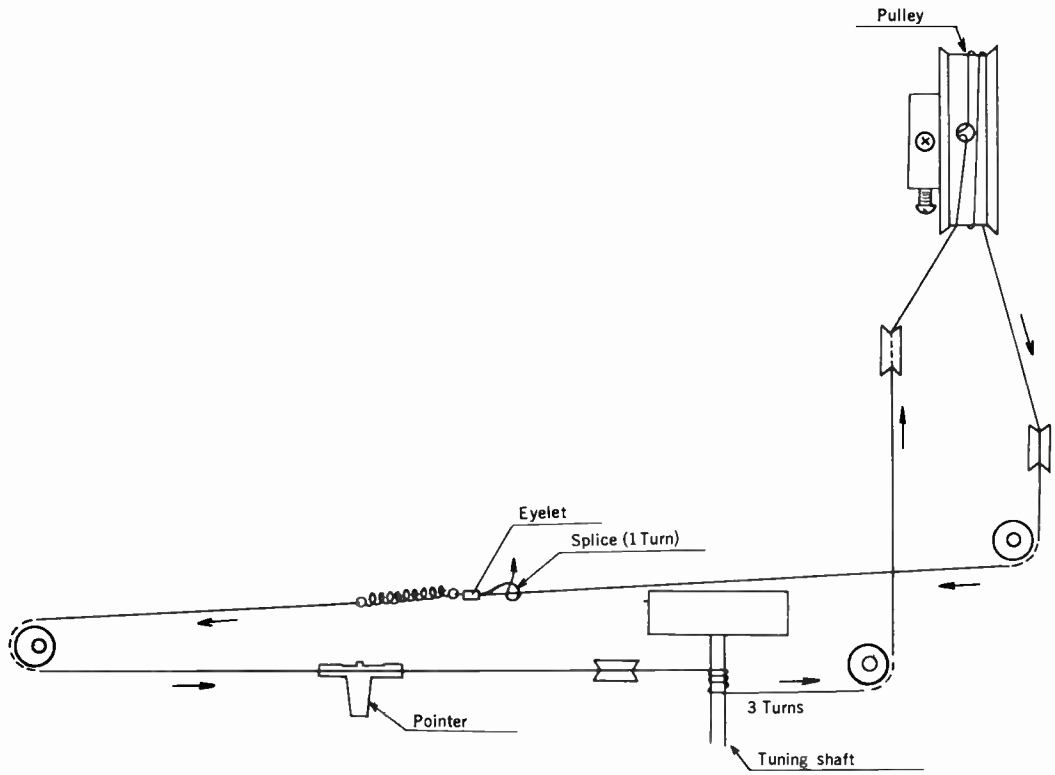
Heads require demagnetizing at regular intervals to maintain high-frequency response, dynamic range, and low distortion. (Follow instructions included with the demagnetizing unit.) After demagnetizing the heads, keep all screwdrivers and other metallic objects away from the head faces. Tape guides may also require occasional demagnetizing.

IMPORTANT: *Be sure to demagnetize the heads after making resistance measurements in the head circuits.*

CARTRIDGES

Many problems associated with tape players result from defective cartridges. Always try a cartridge known to be good before attempting repairs.

Pages 5-16 Courtesy of BELL & HOWELL GENERAL SERVICE DEPARTMENT



ALIGNMENT INSTRUCTION

1. FM Circuit

1-1. Test Equipment Required:

FM band signal generator: 400 Hz 30% modulation (22.5 KHz deviation); 300 ohm Output Imp.
FM IF sweep generator: 10.7 MHz ±500 KHz
VTVM: Low range AF
Oscilloscope: High sensitivity general purpose.
Accurate audio generator (SCA signal generator 7 KHz dev.)
FM stereo signal generator: For MPX tests.

1-2. IF Amplifier Alignment:

Note:

a. For safety, the output should be connected to the loud speaker or equivalent resistance loads.
b. Set the panel controls as follows:
FUNCTION selector; FM.
VOLUME control; 9 o'clock position.
TUNING control; High end.
BALANCE control; Middle
TREBLE-BASS control; Middle
FM AFC switch; OFF.
LOUDNESS; OFF.
FM MUTE; OFF.
MODE; OFF.

V curve

c. The output of IF sweep generator should be connected to the base of TR2 (Use output probe.)

d. The input of IF sweep generator should be connected to the collector of TR9 (Use input probe.)

S curve

e. The input of IF sweep generator should be removed from the collector of TR9 and be connected to the lead of resistor R331 47Ω.

f. The probe for input or output of IF sweep generator should be connected as Fig. 1.

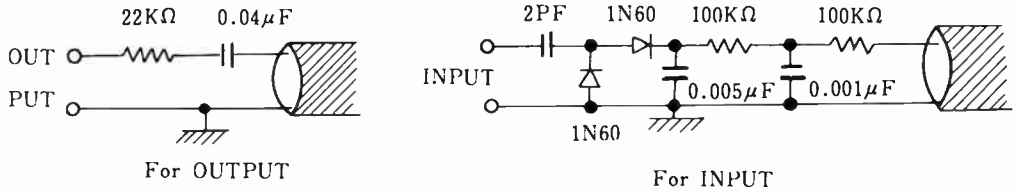


Fig. 1

STEP	ADJUST	WAVEFORM
1	T301, T302, T303, T304(Pri.), T101, T102	Best V Curve
2	T304(Sec)	Best S Curve

1-3. FM Tuner Pack

The FM tuner may require adjustments when the signal is distorted or when the sensitivity has been lowered. Set the FUNCTION selector to FM and the FM AFC switch to OFF. In the steps to follow, the FM signal generator is set for at 30% modulation at 400 Hz at the RF output frequencies. For the output indication, the VTVM and the scope in parallel are connected to the Right speaker outjack.

Step 1 Set the generator output to 86.5 MHz and variable capacitor counter-clockwise.
Adjust the coil L106 for maximum output.

Step 2 Set the generator output to 108.5 MHz and variable capacitor clockwise (minimum cap.)
Adjust the trimmer TC103 for maximum output.

Step 3 Set the generator output to 90 MHz and tune the receiver to this signal.
Adjust the coils L102 and L104 for maximum output.

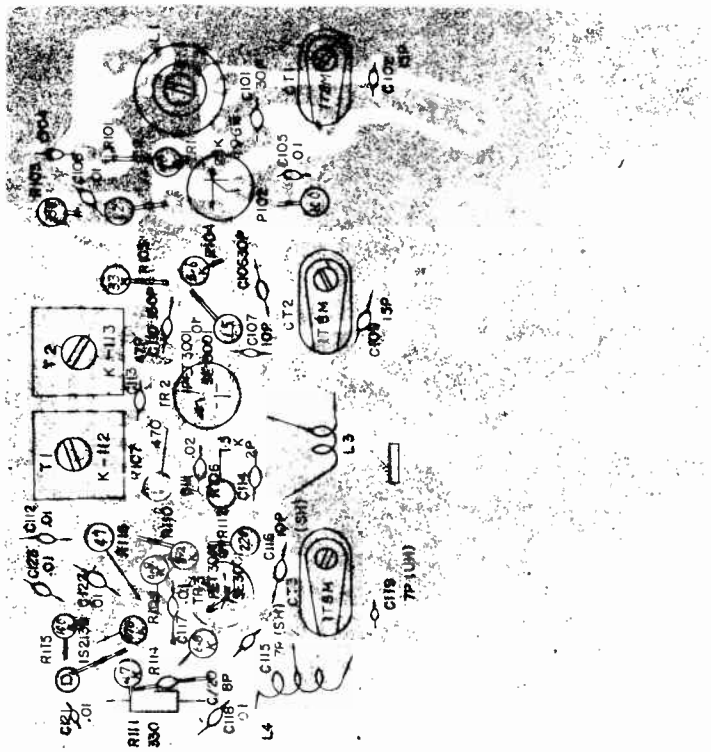
Step 4 Set the generator output to 106 MHz and tune the receiver to this signal.
Adjust the trimmers TC101 and TC102 for maximum output.

Step 5 Repeat the adjustments in Steps 1, 2, 3, and 4.

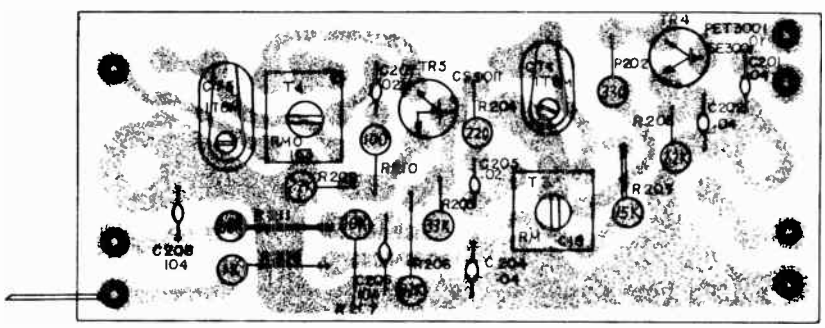
Note :

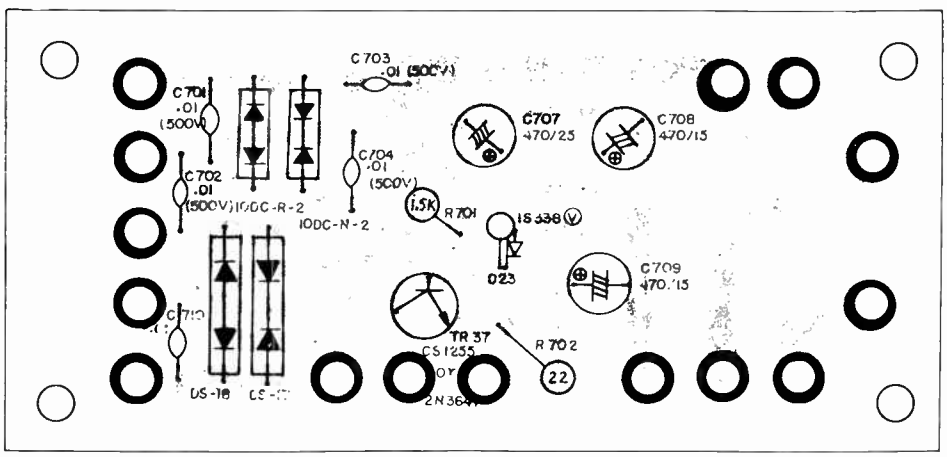
In the above adjustments, do not forget to keep the generator output level as low as possible for the best results.

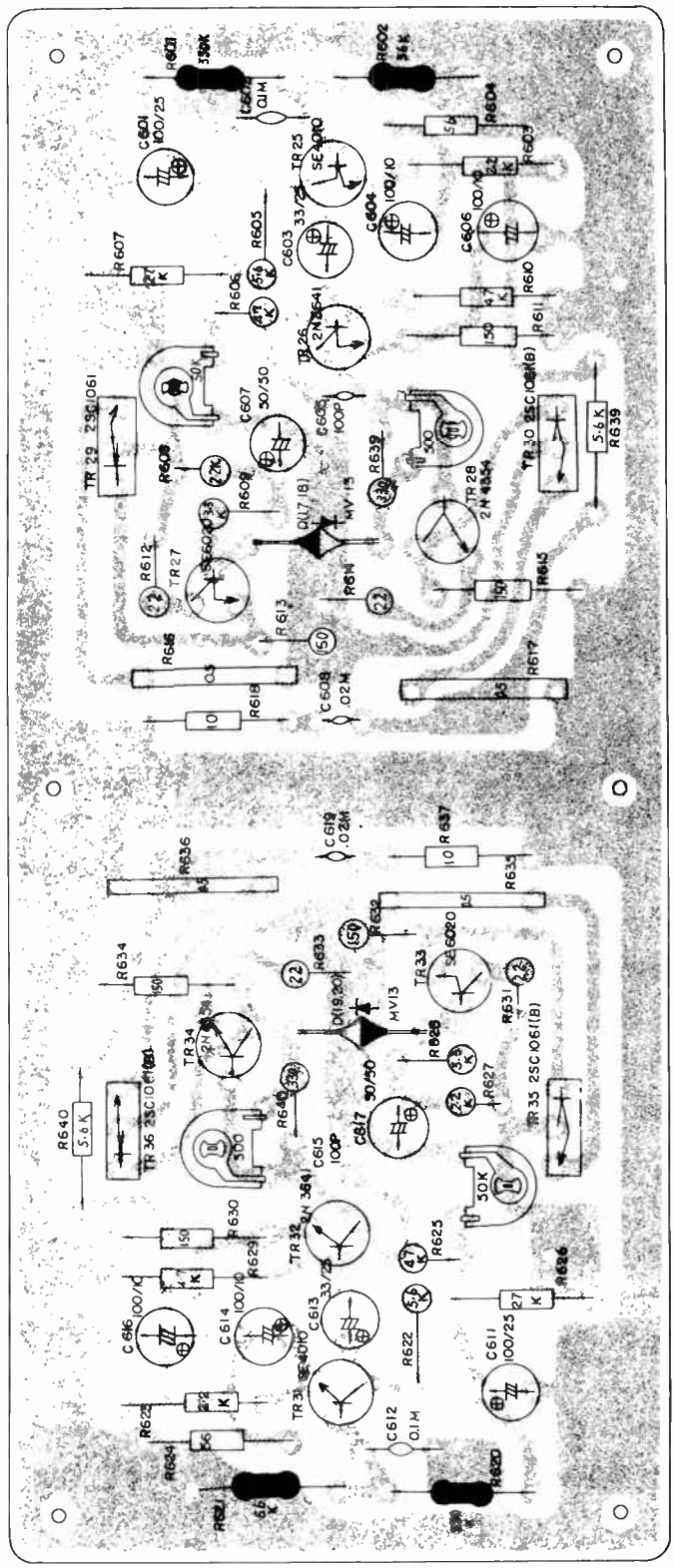
FM TUNER PC BOARD



AM TUNER PC BOARD

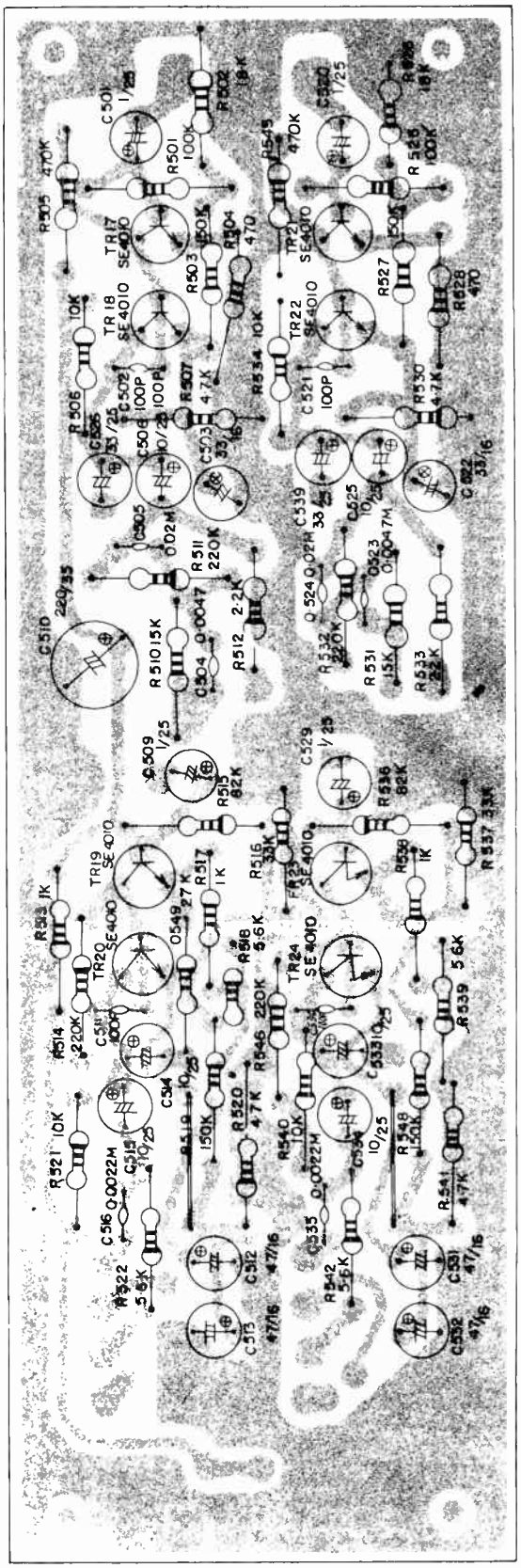






Note; R601, 620, 602, 621 are low noise type resistors.

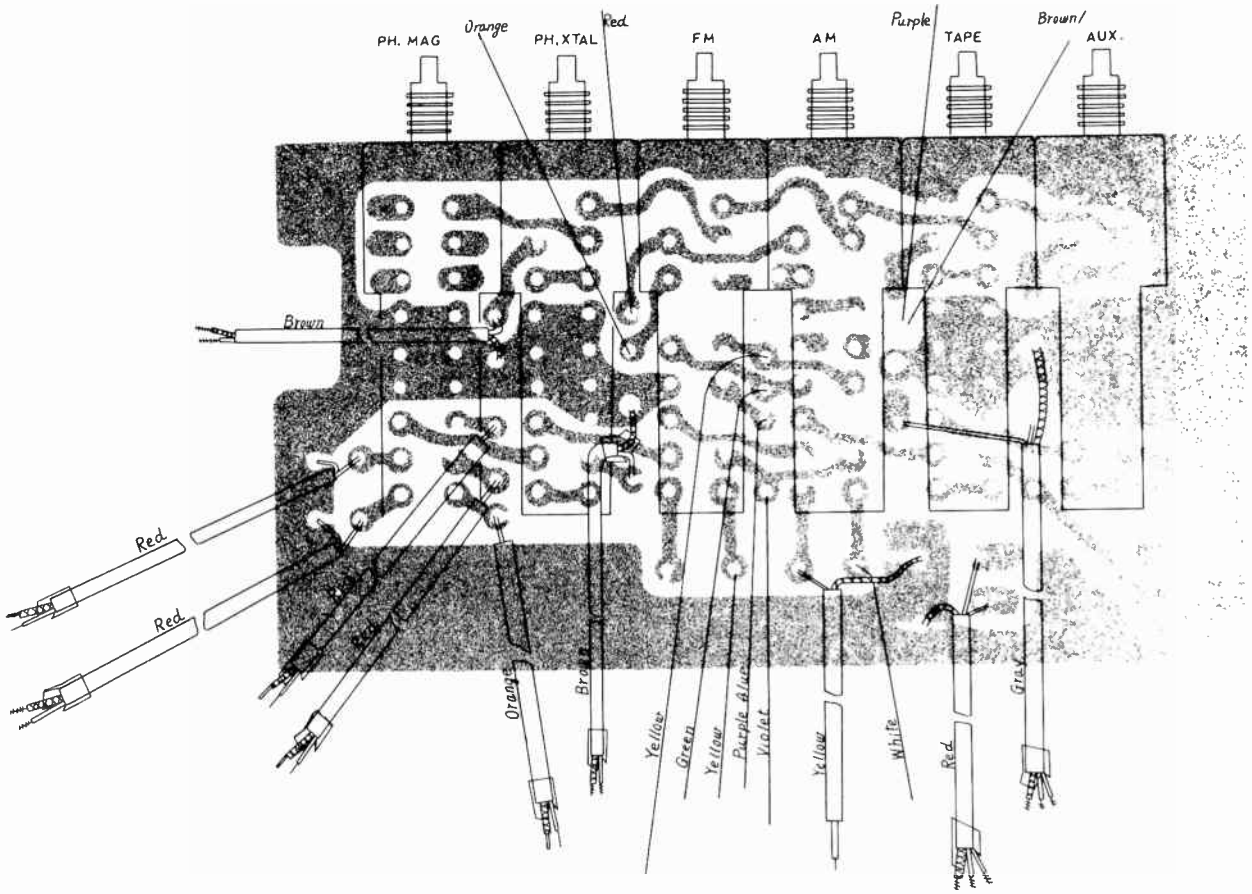
PARTS LOCATION OF MAIN-AMP PC BOARD



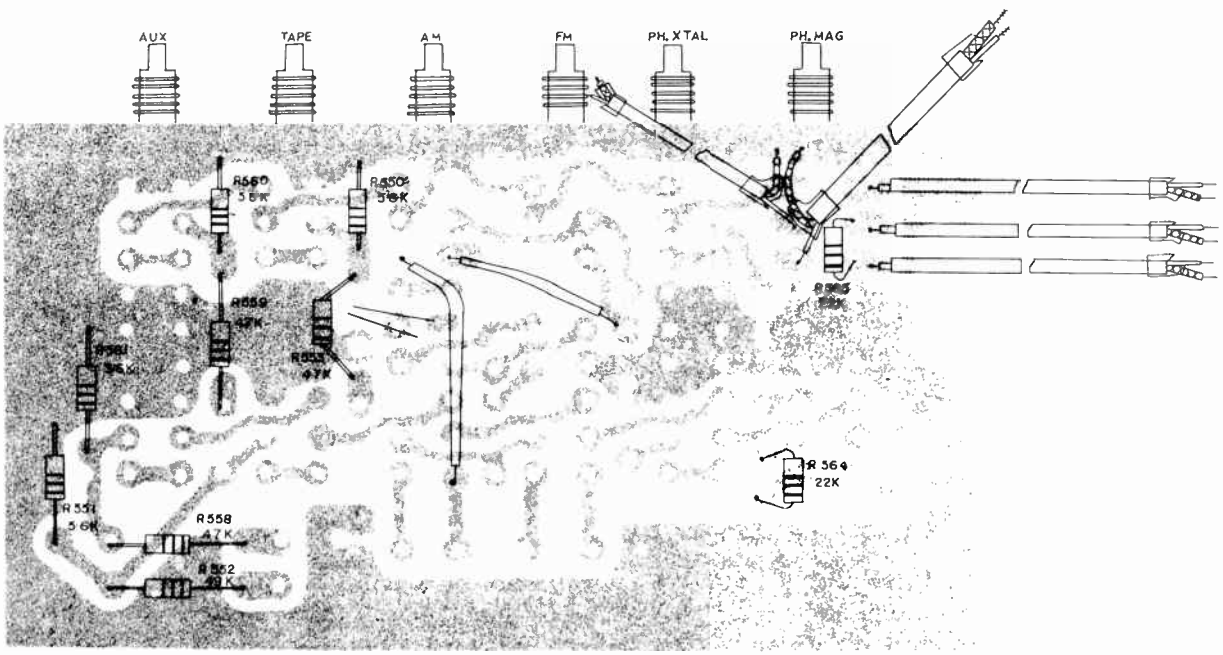
Note; All resistors are those of low noise type.

PARTS LOCATION OF PRE-AMP PC BOARD

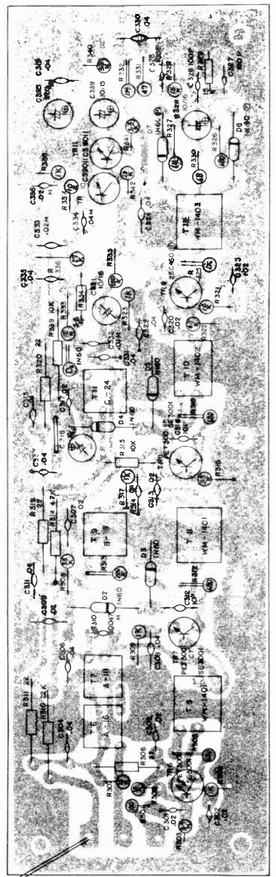
PARTS LOCATION OF SWITCH PC BOARD (TOP VIEW)



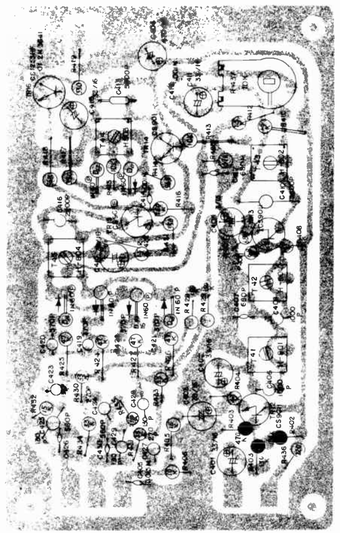
PARTS LOCATION OF SWITCH PC BOARD (BOTTOM VIEW)



PARTS LOCATION OF IF PC BOARD

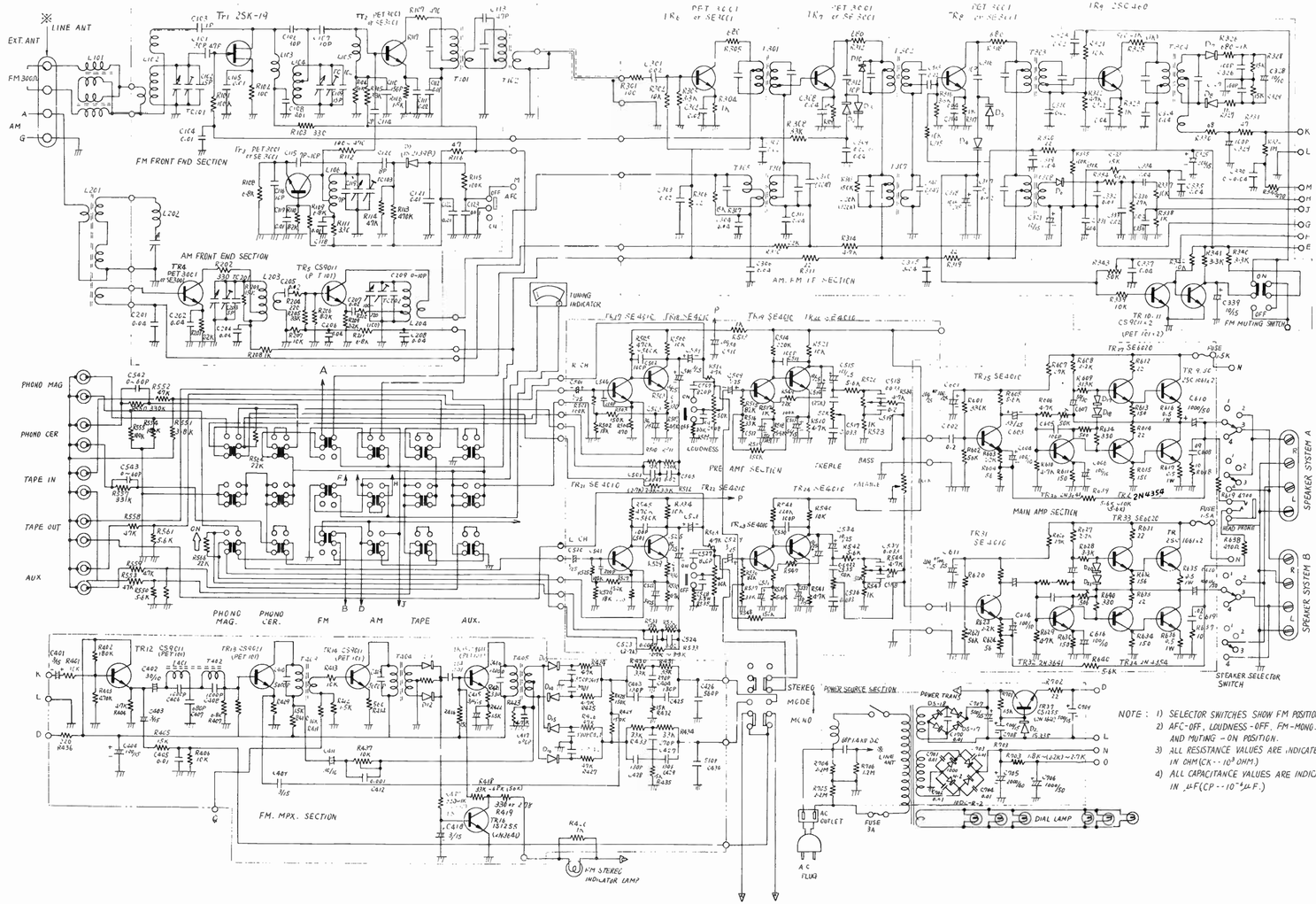


PARTS LOCATION OF MPX PC BOARD



Note; R401, 402 and 403 are

low noise type resistors.



1-4. FM Multiplex Circuit:

The panel controls are as follows;

FUNCTION selector to FM

FM AFC switch to OFF

FM MUTING switch to OFF

MODE switch (FM STEREO MONO switch) to STEREO

VOLUME control at fully counterclockwise.

1-4-1. 67KHz Filter

Step 1. Connect the generator at 67KHz, 0.25 volt output to the capacitor C401 (3μF/6V) Connect the VTVM (and scope) to test point (Center Top of transformer T405).

Step 2. Adjust coil T401 and T402 for minimum indication.

1-4-2. 19KHz. Amplifier

Step 1. Connect the generator at 19KHz, 0.25 volt output to the capacitor C401 (3μF/6V) Connect the VTVM to the junction of diodes D11 and D12.

Step 2. Adjust transformers T403 and T404 for maximum indication.

1-4-3. Separation Adjustments

The general instructions supplied with the FM stereo generator should be followed in the tests.

Set the FM signal generator to 98MHz, 1mV output, modulated 100% with 1KHz.

Set the stereo signal generator for 1KHz modulation, composite signal in the 45% +45%+10%

Main 33.75KHz, Sub. 33.75KHz, Pilot 7.5KHz proportion to modulate the FM signal generator.

Step 1. The initial conditions are as follows:

Generator – 300 ohm output to FM Ant. Terminals, set at 98MHz. FM stereo generator set for Right output.

Receiver – FUNCTION selector to FM

MODE switch (FM STEREO MONO switch) to STEREO

Tune the receiver to 98MHz.

Step 2. Adjust the transformer T405 for maximum output.

Step 3. Connect the VTVM to the Left-TAPE OUT

The reading should be approximately 20 db lower than that of the "Left" output when R437 (Semi-fixed type) is adjusted.

Step 4. Set the FM stereo generator for the "Left" output. Adjust the transformer T405 for maximum output.

Step 5. Connect the VTVM to the Right-TAPE OUT.

The reading should be approximately 32 db lower than that of "Left" output when R437 (Semi-fixed type) is adjusted.

Step 6. Repeat the Steps 2 through 5 several times until the minimum reading is more than 32 db below that of the input to the opposite channel.

1-4-4. Checking of Stereo Indicator Lamp

When the separation is adjusted, check Stereo Indicator Lamp to be switched on.

Step 1. Connect the VTVM to the Speaker terminal (either channel)

Step 2. Adjust the IF transformers T305, T306, T307 and T308 for maximum indication.

3. AM Tuning Circuit

The panel control setting is the same as for the IF amplifier tests. The VTVM (and scope) connection is the same as for the IF amplifier tests.

Step 1. Set the generator to 530KHz and connect to the AM Ant. terminal. Variable Capacitor counter-clockwise (maximum cap.).

Step 2. Adjust the oscillator coil L204 for maximum output.

Step 3. Set the generator to 1650KHz and variable capacitor clockwise (minimum cap.).

Step 4. Adjust the oscillator trimmer TC202 for maximum output.

Step 5. Set the generator to 610KHz and tune the receiver to this signal.

Step 6. Adjust the coils L201 and L203 for maximum output.

Step 7. Set the generator to 1400KHz and tune the receiver to this signal.

Step 8. Adjust the trimmer TC201 for maximum output.

2. AM Circuit

2-1. Test Equipment Required.

AM standard signal generator covering the 455KHz IF band and the medium wave band. The modulation is set to 30% for a 400Hz. modulation frequency. (If available, a sweep generator for the 455KHz band will speed up the alignment.)

VTVM : low range AF

Oscilloscope : general purpose

2-2. IF Amplifier Alignment

Note:

a. For safety, the output should be connected to loudspeakers or equivalent resistance loads.

b. Set the panel controls as follows:

FUNCTION selector to AM

MODE switch (FM STEREO MONO switch) to MONO

VOLUME control at fully clockwise

c. The modulated 455KHz signal is connected to TR4 Base, and should be kept at a low levevl consistent with good measurement.

SEMICONDUCTORS

ITEM	PART NO./TYPE
D1	1S2139B
D2	1N60
D3	1N60
D4	1N60
D5	1N60
D6	1N60
D7	1N60P
D8	1N60P
D10	HV-23
D11	1N60P
D12	1N60P
D13	1N60P
D14	1N60P
D15	1N60P
D16	1N60P
D17	MV-13
D18	MV-13
D20	MV-13
D23	1S338
TR1	2SK19
TR2	PET3001 (SE3001)
TR3	PET3001 (SE3001)
TR4	PET3001 (SE3001)
TR5	CS9001
TR6	PET3001 (SE3001)
TR7	PET3001 (SE3001)
TR8	PET3001 (SE3001)
TR9	2SC460
TR10	CS9011
TR11	CS9011
TR12	CS9011
TR13	CS9011
TR15	CS9011
TR16	CS1255HF (2N3641)
TR17	SE4010
TR18	SE4010
TR19	SE4010
TR20	SE4010
TR21	SE4010
TR22	SE4010
TR23	SE4010
TR24	SE4010
TR25	SE4010
TR26	SE4010
TR27	SE4010
TR28	SE4010
TR29	2SC1061
TR30	2SC1061
TR31	SE4010
TR32	2N3641
TR33	SE6020
TR34	2N4354
TR35	2SC1061
TR36	2SC1061
TR37	CS1255 (ZN3641)

ELECTROLYTIC CAPS

ITEM	VALUE	
C321	10mfd	15V
C325	200mfd	15V
C328	10mfd	10V
C401	3.3mfd	16V
C402	30mfd	10V
C403	3.3mfd	16V
C404	470mfd	16V
C409	3.3mfd	16V
C411	33mfd	16V
C415	3.3mfd	16V
C418	3.3mfd	16V
C501	1mfd	25V
C503	33mfd	16V
C506	10mfd	25V
C509	1mfd	25V
C510	220mfd	35V
C512	47mfd	16V
C513	47mfd	16V
C514	10mfd	25V
C515	10mfd	25V
C520	1mfd	25V
C522	33mfd	16V
C525	10mfd	25V
C526	3mfd	25V
C529	1mfd	25V
C531	47mfd	16V
C532	47mfd	16V
C533	10mfd	25V
C534	10mfd	25V
C539	3mfd	25V
C601	100mfd	25V
C603	33mfd	25V
C604	100mfd	10V
C606	100mfd	10V
C607	50mfd	50V
C610	1000mfd	50V
C611	100mfd	25V
C613	33mfd	25V
C614	100mfd	10V
C616	100mfd	10V
C617	50mfd	50V
C705	2000mfd	60V
C706	1000mfd	50V
C707	470mfd	25V
C708	470mfd	16V
C709	470mfd	16V

VARIABLE CAPS

ITEM	PART NO.
TC101	IT8M
TC102	IT8M
TC103	IT8M
TC104	IT8M
TC105	IT8M

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R437	R382002	10K Separation
	R36304	50K Dual Volume
	R361020	50K Dual Treble
	R361020	50K Dual Bass
	R361021	100K Balance

COILS/TRANSFORMERS

ITEM	PART NO.
L203	RM018
L204	OM0163
T101	K-112
T102	K-113
T301	WM-1401
T302	WM-1401
T303	WM-1402
T304	WM-1403
T305	A-16
T306	A-18
T307	B-15
T308	C-24
T401	H-801
T402	H-801
T403	H-802
T404	H-803
T405	H-804
Power	R110081
AM Antenna	R180211
Impedance Converter	R170029

MISCELLANEOUS

NAME	PART NO.
Fuse, 3A	R412011
Holder, Fuse	R434005
P.C. Board, Tuner	R530205A
P.C. Board, MPX	R530208A
P.C. Board, Preamp	R530209A
P.C. Board, Power Supply	R530244
Speaker	R436022
Switch, Power	R429028
Assembly, Mode Switches	R429009
Assembly, Control Switch (4 Section)	R429011

CABINET PARTS

NAME	PART NO.
Cover, Top	R651206
Board, Left Side	R849029
Board, Right Side	R849030
Cover, Bottom	R651466
Window, Dial	R860525
Knob, Volume/Tone Controls	R871151
Knob, Tuning	R871150
Button, Switch	R871154

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MECHANICAL ADJUSTMENTS

PRESSURE ROLLER ADJUSTMENT

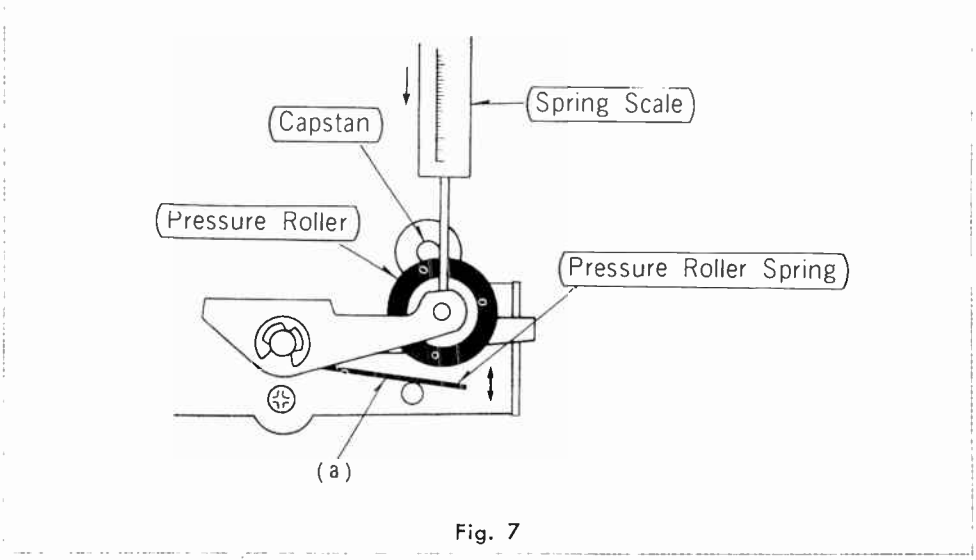


Fig. 7

1. Place the set into the PLAYBACK mode.
2. Hook a spring scale as shown in the figure and push it in the arrow direction.
3. Measure the value at the moment when the pressure roller comes off from the capstan.
4. The standard pressure of the pressure roller is 12.3 ~17.6 oz (350~500 gr).
5. If the measured value is outside the standard, bend the (a) part in either of the directions shown by the arrow so that pressure of the pressure roller becomes between 350~500 gr.

TAKEUP TORQUE ADJUSTMENT

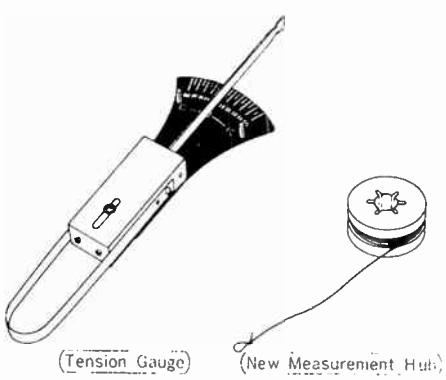


Fig. 8

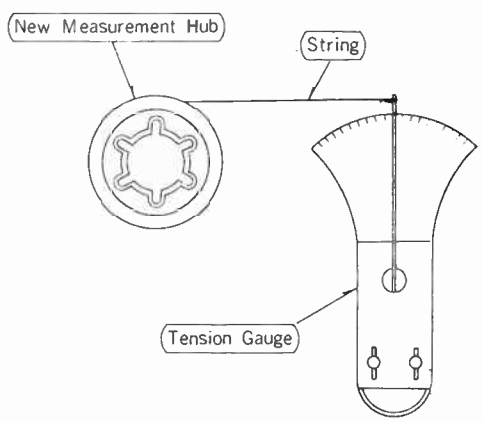


Fig. 9

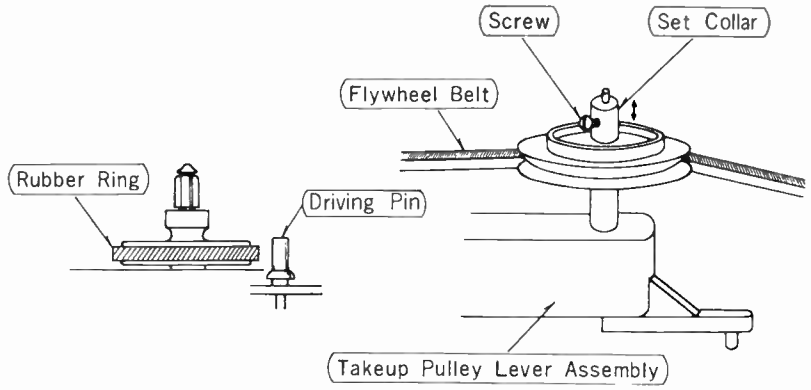


Fig. 10

Instruments required: Tension gauge (having a range of 20 ~ 100 gr-cm), new measurement hub.

1. Place the set in playback mode, and put the new measurement hub with the tension gauge into the takeup reel table.
2. The standard takeup torque of the takeup reel table is 45~60 gr-cm.
3. In case that the takeup torque is beyond the limits, check the following parts.

* Clean oil and dust adhering to flywheel belt and the rubber ring of the takeup reel table.

Adjust by moving the set collar shown in Fig. 10 in either of the direction shown by the arrow. When too high, upward, if too low, downward.

RECORD/PLAYBACK ANGLE ADJUSTMENT

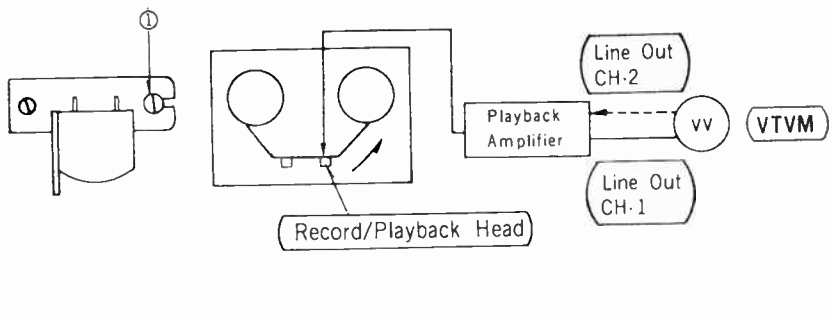


Fig. 11

Instruments required: VTVM, standard tape for 3 kHz (at 1·7/8 ips) angle adjustment (or tape on which recording is made by a reliable tape recorder).

Connect wires as shown in Fig. 11, thread the tape and place the tape recorder into the playback mode. Turn either of the angle adjustment screw ① in Fig. 11 by a 1/4 turn, and make the adjustment so that the reading on the VTVM connected to the line out becomes maximum.

AMPLIFIER ADJUSTMENTS

CONDITIONS FOR MEASUREMENT

Power Voltage .....120 V 60 Hz
Mode Switch .....STEREO
Speaker Switch .....ON
Volume Control .....MAXIMUM
Bass & Treble Control.....CENTER
Balance Control .....CENTER

	ITEM	SIGNAL SOURCE CONNECTION	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Measurement & adjustment of erase current	—	VTVM to both ends of erase head. Fig. 12.	* TAPE * RECORD	L11 VR11	* Set S10 or S7 to OFF and stop motor. * Adjust L11 so that VTVM indicates MAXIMUM. * Adjust VR11 so that VTVM indicates 8 V.
2	Measurement & adjustment of recording bias current	—	TP7 (for CH1) TP8 (for CH2) Fig. 13.	* TAPE * RECORD	L9 (for CH1) L10 (for CH2)	* Adjust L9 (CH1) and L10 (CH2) so that VTVM indicates 50 mV. * Check (1) again and confirm it is 8 V.
3	Measurement of recording level	Supply 1 kHz −80 dB ± 3dB to mic input jack.	TP7 (for CH1) TP8 (for CH2) Fig. 14.	* TAPE * RECORD	—	* Confirm, by watching VTVM, that 5 mV output is obtained.
4	Level meter adjustment	Supply 1 kHz to mic input jack. 1 kHz −80 dB ± 3 dB to mic input jack.	5 mV at TP7 (for CH1) or TP8 (for CH2). Fig. 14.	* TAPE * RECORD	VR9 (for CH1) VR10 (for CH2)	* Adjust VR9 (CH1) and VR10 (CH2) so that VU meter indicates 0 VU.
5	Measurement of playback amplifier gain	1 kHz −97 dB ± 3 dB to head lead wire.	VTVM and 8Ω resistor to ext. sp. jack. Fig. 15.	* TAPE * PLAY-BACK	—	* Confirm, by watching VTVM, that 1 V output is obtained.

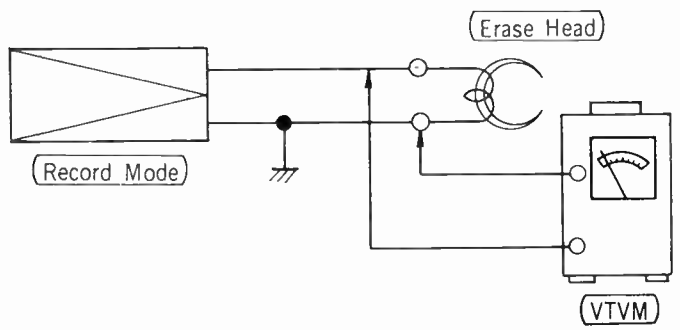


Fig. 12

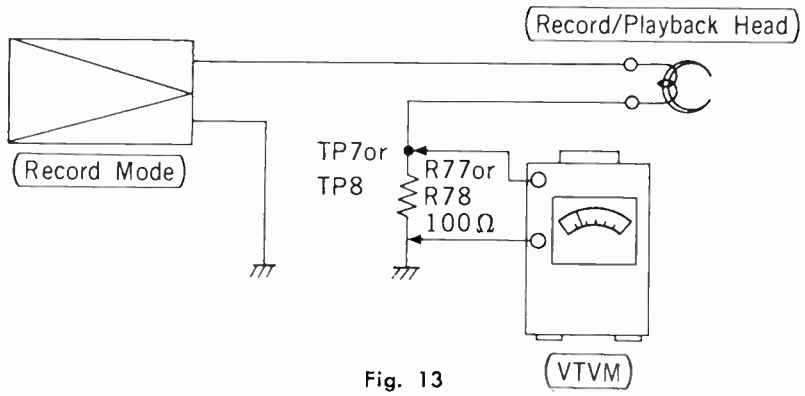


Fig. 13

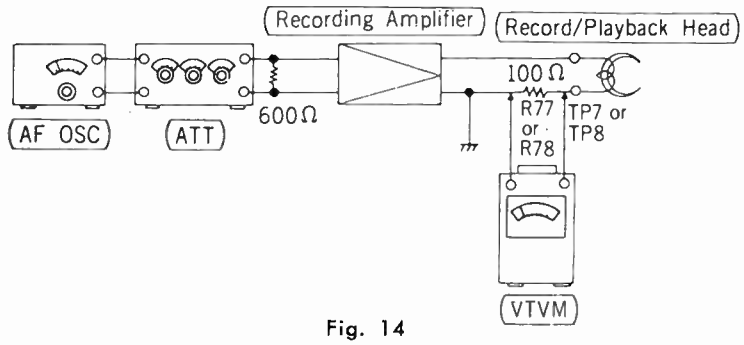


Fig. 14

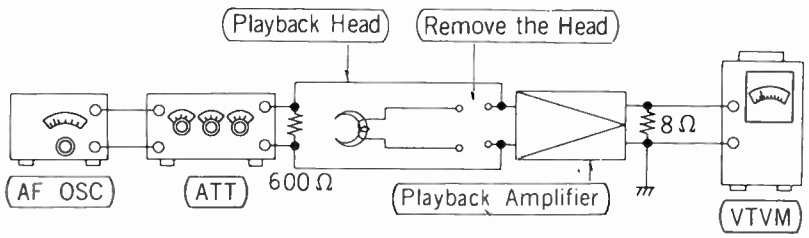


Fig. 15

ALIGNMENT INSTRUCTIONS OF RADIO

FREQUENCY & DISTANCE ON DIAL SCALE

To accurately align the proper frequencies to the dial scale, refer to table and mark the edge of the dial scale plate accordingly using the "Start Point" mark on the dial scale as a reference point.

DIAL THREADING

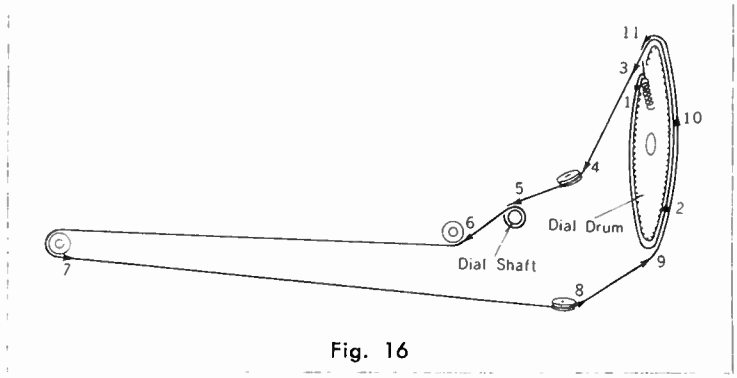


Fig. 16

TABLE

Band	Frequency	Distance from "Start Point"	
AM	550kHz	15.1mm	19/32"
	1500kHz	121.9mm	4-4/5"
FM	90MHz	20.7mm	4/5"
	106MHz	96.4mm	3-4/5"

AM, FM IF & RF ALIGNMENT

AM IF & RF ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output re· ng.
·Set band selector switch to AM.
Set volume control to maximum.
Set tone control to treble.
Set balance control to center.
Maintain line voltage at 120 volts.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz (400∿ Mod.)	Point of non-interference. (on about 66 kHz)	Output meter across ext. sp. jack (L).	T4 (1st IFT) T6 (2nd IFT) T9 (3rd IFT)	Adjust for maximum output.
2	Fashion loop of several turns of wire and radiate signal into loop of receiver.	550 kHz (400∿ Mod.)	550 kHz	Output meter across ext. sp. jack (L).	L6 (OSC Coil) L5 (ANT Coil)	Adjust for maximum output by sliding coil (L5) along ferrite core.
3	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1500 kHz (400∿ Mod.)	1500 kHz	Output meter across ext. sp. jack (L).	C32 (OSC Trimmer) C26 (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).

Notes: 1. Cement antenna bobbin with wax after completing alignment.
2. Remove line cord antenna from FM external antenna terminal when aligning.
3. Make certain that speaker system or 8Ω dummy resistor is connected to the ext. sp. jack when aligning.

FM IF & DETECTOR ALIGNMENT WITH OSCILLOSCOPE

EQUIPMENT REQUIRED
Signal generator that provides 10.7 MHz marker.
Sweep generator that provides 10.7 MHz center frequency and 400 kHz sweep width.

OSCILLOSCOPE
Set sweep selector of oscilloscope to "External Sweep". Apply 60∿ sweep signal from sweep generater to horizontal input terminals of oscilloscope.
Set band selector switch to FM.
Set volume control to minimum.
Set tone control to treble.
Set balance control to center.
Set AFC switch to "OFF".
Maintain line voltage at 120 volts.

Note: Unsolder lead between test point TP3 and point A before alignment and resolder it after alignment.

	SWEEP GENERATOR COUPLING	SIGNAL GENERATOR COUPLING	RADIO DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
1	High side thru. .001 mfd. to point TP2. Common to chassis.	High side thru. .001 mfd. to point TP2. Common to chassis.	Point of non-interference. (on about 90 MHz)	Connect vert. amp. of scope to point TP3. Common to chassis.	T1 (FM 1st IFT) T2 (FM 1st IFT) T3 (FM 2nd IFT) T5 (FM 3rd IFT) T7 (FM 4th IFT)	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to Fig. 17)
2	High side thru. .001 mfd. to point TP2. Common to chassis.	High side thru. .001 mfd. to point TP2. Common to chassis.	Point of non-interference. (on about 90 MHz)	Connect vert. amp. of scope to point TP4. Common to chassis.	T8 (FM 4th IFT)	Adjust T8 so that 10.7 MHz marker is at the center. (Refer to Fig. 18)

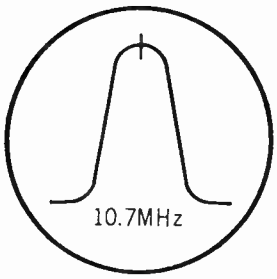


Fig. 17

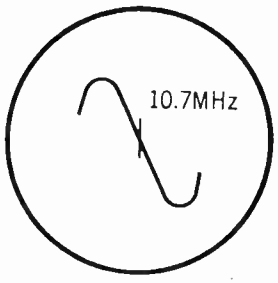


Fig. 18

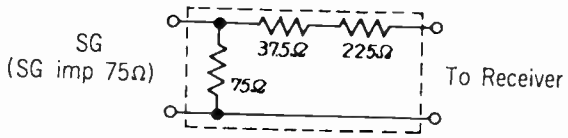


Fig. 19 FM DUMMY ANTENNA

FM RF ALIGNMENT

Output of signal generator should be no higher than necessary to obtain an output reading.
Set band selector switch to FM.
Set volume control to maximum.
Set tone control to treble.
Set balance control to center.
Set AFC switch to "OFF".
Maintain line voltage at 120 volts.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
3	Connect to EXT FM antenna terminal through FM Dummy antenna. Common to chassis. (Refer to Fig. 19)	90 MHz (400∿ Mod.)	90 MHz	Output meter across ext. sp. jack (L).	L4 (FM OSC Coil) L1 (FM ANT Coil) L2 (FM Collector Coil)	Adjust for maxim -put.
4	Connect to EXT FM antenna terminal through FM Dummy antenna. Common to chassis. (Refer to Fig. 19)	106 MHz (400∿ Mod.)	106 MHz	Output meter across ext. sp. jack (L).	C17 (FM OSC Trimmer) C1 (FM ANT Trimmer) C8 (FM Collector Trimmer)	Adjust for maximum output. Repeat steps (3) and (4).

Note: As three output responses will be present, proper tuning is the center frequency.

FM-STEREO ALIGNMENT

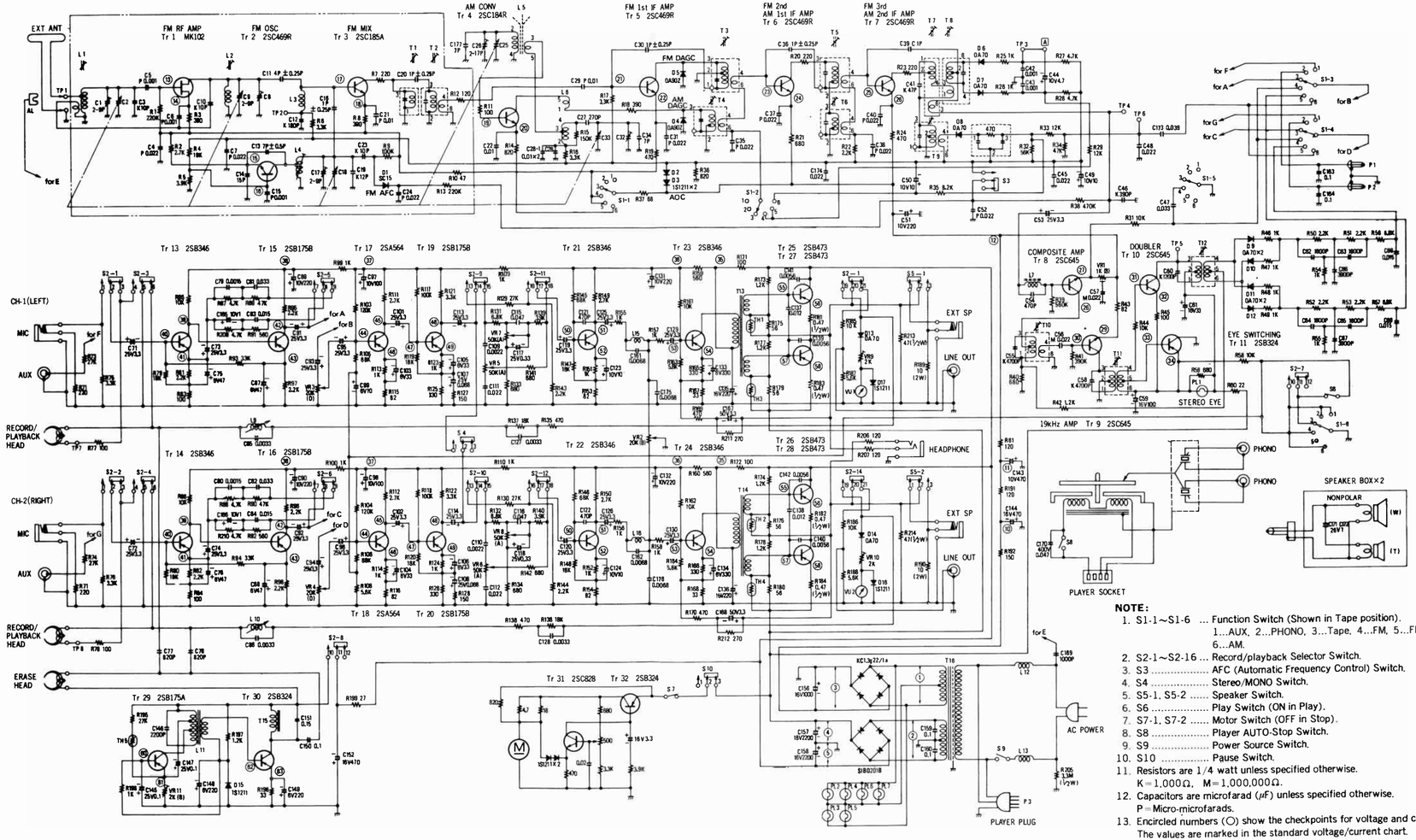
MULTIPLEX COIL ALIGNMENT

EQUIPMENT REQUIRED

Stereo Modulator.....Connect Stereo Modulator output to EXT Mod. terminal of signal generator.
Signal Generator .....Modulation Rate of 19 kHz Pilot Signal.....8~10%
Output Level.....60 dB
Frequency .....Approx. 98 MHz
Oscilloscope
Dummy Antenna
VTVM

PROCEDURE

Tuner .....Selector switch to "FM STEREO", Dial setting to approx. 98 MHz, AFC switch to "OFF", Tone control to "TREBLE", Balance control to "CENTER", Volume control to audible level of speaker sound.



NOTE:

1. S1-1～S1-6 ... Function Switch (Shown in Tape position). 1...AUX, 2...PHONO, 3...Tape, 4...FM, 5...FM Stereo, 6...AM.
2. S2-1～S2-16 ... Record/playback Selector Switch.
3. S3 ..... AFC (Automatic Frequency Control) Switch.
4. S4 ..... Stereo/MONO Switch.
5. S5-1, S5-2 ..... Speaker Switch.
6. S6 ..... Play Switch (ON in Play).
7. S7-1, S7-2 ..... Motor Switch (OFF in Stop).
8. S8 ..... Player AUTO-Stop Switch.
9. S9 ..... Power Source Switch.
10. S10 ..... Pause Switch.
11. Resistors are 1/4 watt unless specified otherwise. K=1,000Ω, M=1,000,000Ω.
12. Capacitors are microfarad (μF) unless specified otherwise. P=Micro-microfarads.
13. Encircled numbers (○) show the checkpoints for voltage and current. The values are marked in the standard voltage/current chart.

STANDARD VOLTAGE/CURRENT CHART

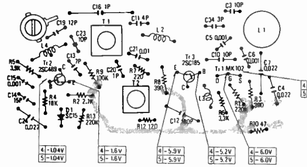
Check Point	AUX PHONO	Tape	Tape REC	FM	FM, ST	AM	Check Point	AUX PHONO	Tape	Tape REC	FM	FM, ST	AM
①	AC 10.7V	AC 10.7V	AC 10.7V	AC 10.7V	AC 10.7V	AC 10.7V	㉕	8.2V	8.2V	8.1V			
②	AC 14.7V	AC 14.7V	AC 14.7V	AC 14.7V	AC 14.7V	AC 14.7V	㉖	6.2V	6.2V	6.1V			
③	13.2V	-13.2V	13.2V	13.2V	13.2V	13.2V	㉗	4.3V	4.3V	4.2V			
④	+9.2V	+9.2V	+9.2V	+9.2V	+9.2V	+9.2V	㉘		3.45V	3.4V			
⑤	-9.2V	-9.2V	9.2V	-9.2V	9.2V	9.2V	㉙		-1.45V	1.4V			
⑩				-10.8V	-10.8V	-11.2V	㊵		-0.51V	0.5V			
⑪				-8.6V	8.6V	9.4V	㊶		-0.45V	0.44V			
⑫				6.6V	6.6V	7.75V	㊷		2.17V	-2.15V			
⑬				6.0V	-6.0V		㊸		1.32V	1.30V			
⑭				4.7V	4.7V		㊹	1.45V	-1.45V	1.4V	1.45V	(0.18V)	
⑮				1.6V	-1.6V		㊺	2.5V	2.5V	2.46V			
⑯				1.04V	1.04V		㊻	0.8V	-0.8V	0.8V			
⑰				5.2V	5.2V		㊼	-0.66V	-0.66V	0.65V			
⑱				-5.9V	5.9V		㊽	-2.82V	-2.82V	-2.79V			
⑲						-6.4V	㊾	-0.52V	-0.52V	0.51V			
⑳						-7.05V	㊿	-1.41V	-1.41V	-1.39V			
㉑				-5.25V	-5.25V		(51)	-3.2V	-3.2V	-3.1V			
㉒				-5.9V	-5.9V		(52)	-1.31V	-1.31V	-1.30V			
㉓				-5.4V	-5.4V	-6.3V	(53)	-2.38V	-2.38V	-2.35V			
㉔				-6.1V	-6.1V	-7.0V	(54)	-2.32V	-2.32V	-2.29V			
㉕				-5.3V	-5.3V	-6.45V	(55)	0.115V	0.115V	-0.11V			
㉖				-6.05V	-6.05V	-7.1V	(56)	8～ 30mA					
㉗					-5.8V		(57)	+9.1V	+9.1V	+9.1V			
㉘					-0.66V		(58)	8～ 30mA					
㉙					-6.45V		(59)			-8.45V			
㉚					-5.7V		(60)			-0.69V			
㉛					+9.25V		(61)			-0.87V			
㉜					+9.25V		(62)			-0.7V			
㉝					+9.25V		(63)			-0.63V			
㉞					+9.25V								

NOTE:

All measurements are under no signal conditions with volume at minimum position.
Use M-type VTVM for AC voltage measurements and P-type VTVM for DC voltage measurements.

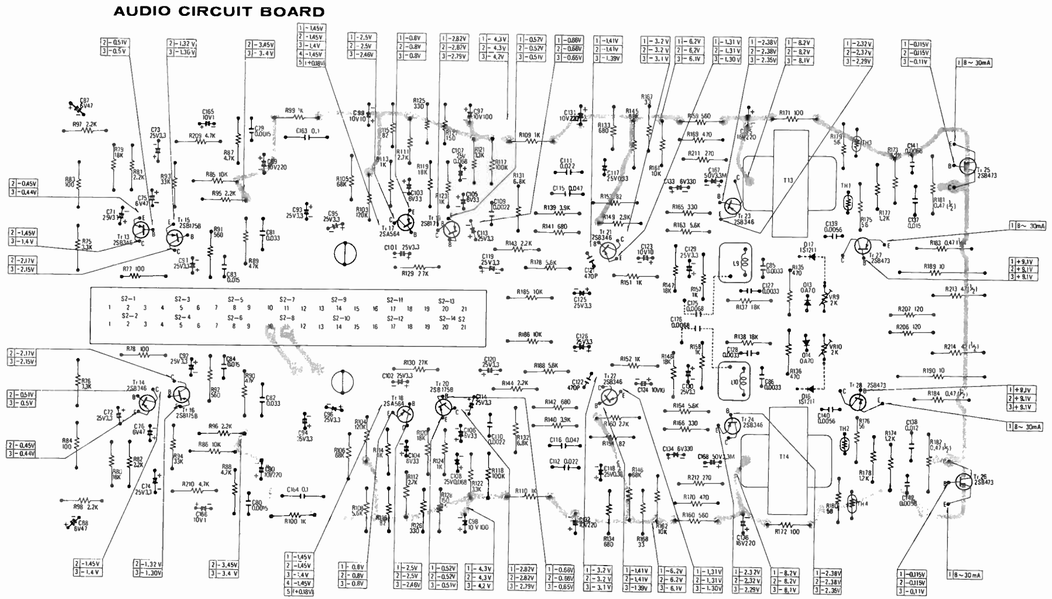
CIRCUIT BOARD

RF CIRCUIT BOARD

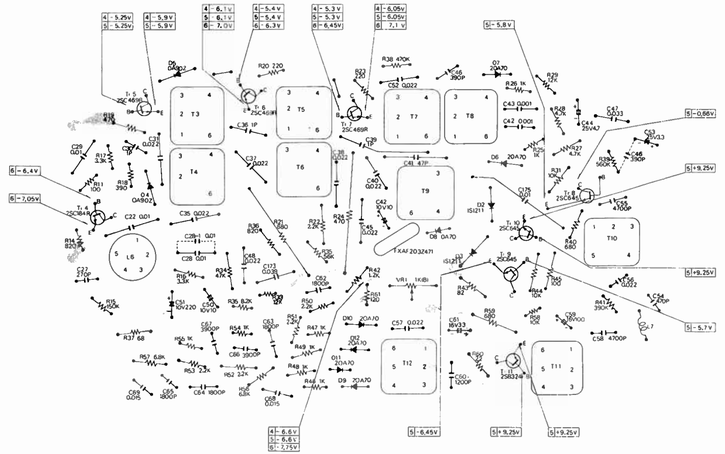


NOTE:
The circuit shown in red on the conductor side is B circuit
Values indicated in [ ] are DC voltages between the chassis and electrical parts
Numerals show values of voltage at
1...AUX PHONO, 2 Tape, 3 Tape REC, 4 FM, 5 FM ST and
6 AM, respectively
When no numeral is given the same voltage is applied at 1 ~ 6

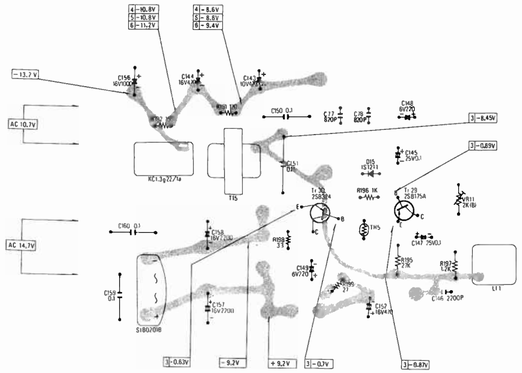
AUDIO CIRCUIT BOARD



IF CIRCUIT BOARD



OSCILATOR CIRCUIT BOARD



SEMICONDUCTORS

ITEM	PART NO./TYPE		
D1	SC15	TR6	2SC469R
D2	1S1211	TR7	2SC469R
D3	1S1211	TR8	2SC645C
D4	0A90Z	TR9	2SC645C
D5	0A90Z	TR10	2SC645C
D6	20A70	TR11	2SB324 (A,B,C,D)
D7	20A70	TR13	2SB346
D8	0A70	TR14	2SB346
D9	20A70	TR15	2SB175B
D10	20A70	TR16	2SB175B
D11	20A70	TR17	2SA564 (P,Q)
D12	20A70	TR18	2SA564 (P,Q)
D13	0A70	TR19	2SB175B
D14	0A70	TR20	2SB175B
D15	1S1211	TR21	2SB346
D16	1S1211	TR22	2SB346
D17	1S1211	TR23	2SB346
Rectifier	KC1.3G22/1a	TR24	2SB346
Rectifier	S1B0201B	TR25	2SB473 (D,E,F,G,H,N,O)
TR1	MK102	TR26	2SB473 (D,E,F,G,H,N,O)
TR2	2SC469R	TR27	2SB473 (D,E,F,G,H,N,O)
TR3	2SC185A	TR28	2SB473 (D,E,F,G,H,N,O)
TR4	2SC184R	TR29	2SB175A
TR5	2SC469R	TR30	2SB324 (G,H,I,J,K,L)

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C1	ECV5XR27B14S	Tuning Gang
C2		
C8		
C9		
C18		
C25		
C26		
C32		
C33		
C17	ECV1ZW10P12	Trimmer
C44	ECEB10V4R7N	4.7mfd
C49	ECEA10V10N	10mfd
C50	ECEA10V10N	10mfd
C51	ECEA10V220N	220mfd
C53	ECEA25V3R3N	3.3mfd
C59	ECEA16V100N	100mfd
C61	ECEA16V33N	33mfd
C71	ECEA25V3R3N	3.3mfd
C72	ECEA25V3R3N	3.3mfd
C73	ECEA25V3R3N	3.3mfd
C74	ECEA25V3R3N	3.3mfd
C75	ECEA6V47N	47mfd
C76	ECEA6V47N	47mfd
C87	ECEA6V47N	47mfd
C88	ECEA6V47N	47mfd
C89	ECEA10V220N	220mfd
C90	ECEA10V220N	220mfd
C91	ECEA25V3R3N	3.3mfd
C92	ECEA25V3R3N	3.3mfd
C93	ECEA25V3R3N	3.3mfd
C94	ECEA25V3R3N	3.3mfd
C95	ECEA25V3R3N	3.3mfd
C96	ECEA25V3R3N	3.3mfd
C97	ECEA10V100N	100mfd
C98	ECEA10V100N	100mfd
C99	ECEA10V10N	10mfd
C101	ECEA25V3R3N	3.3mfd
C102	ECEA25V3R3N	3.3mfd
C103	ECEA6V33N	33mfd
C104	ECEA6V33N	33mfd
C105	ECEA6V33N	33mfd
C106	ECEA6V33N	33mfd
C107	ECAG25ER068	.068mfd
C108	ECAG25ER068	.068mfd
C113	ECEA25V3R3N	3.3mfd
C114	ECEA25V3R3N	3.3mfd
C117	ECAG25ER33	.33mfd
C118	ECAG25ER33	.33mf
C119	ECEA25V3R3N	3.3mfd
C120	ECEA25V3R3N	3.3mfd
C123	ECEA10V10N	10mfd
C124	ECEA10V10N	10mfd
C125	ECEA25V3R3N	3.3mfd
C126	ECEA25V3R3N	3.3mfd
C129	ECEA25V3R3N	3.3mfd
C130	ECEA25V3R3N	3.3mfd
C131	ECEA10V220N	220mfd
C132	ECEA10V220N	220mfd
C133	ECEA6V330N	330mfd
C134	ECEA6V330N	330mfd
C135	ECEA16V220N	220mfd
C136	ECEA16V220N	220mfd
C143	ECEA10V470N	470mfd
C144	ECEA16V470N	470mfd
C145	ECAG25ER1	.1mfd
C147	ECAG25ER1	.1mfd
C148	ECEA6V220N	220mfd
C149	ECEA6V220N	220mfd
C152	ECEA16V470N	470mfd
C156	ECEA16V1000N	1000mfd
C157	ECEA16V2200N	2200mfd
C158	ECEA16V220N	2200mfd
C165	ECAG10E1	.1mfd
C166	ECAG10E1	.1mfd
C167	ECEA50V3R3M	3.3mfd
C168	ECEA50V3R3M	3.3mfd
C171	ECEB50Y1	1mfd
C172	ECEB50Y1	1mfd

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R181	ERM12PKR47	.47 ohms, 1/2W WW
R182	ERM12PKR47	.47 ohms, 1/2W WW
R183	ERM12PKR47	.47 ohms, 1/2W WW
R184	ERM12PKR47	.47 ohms, 1/2W WW
TH1	QVM300A	Thermistor
TH2	QVM300A	Thermistor
TH3	QVM300A	Thermistor
TH4	QVM300A	Thermistor
TH5	QVM103	Thermistor
VR1	EVLS0AA00B13	1000 ohms Separation
VR2	EVCB0AL20B24	20K Balance
VR3 & VR4	EVFK1AL20D24	20K Dual Volume
VR5	EVFK1AL20A54	50K Tone
VR6	EVFK1AL20A54	50K Tone
VR7	EVFK1AL20A54	50K Tone
VR8	EVFK1AL20A54	50K Tone
VR9	EVLT2AA00B23	2000 ohms Level Indicator
VR11	EVLT2AA00B23	2000 ohms Level Indicator
VR12	EVLT2AA00B23	2000 ohms Erase Current

COILS/TRANSFORMERS

ITEM	PART NO.		
L1	RLA4P6	T2	RL14B151
L2	RLD4Y7	T3	RL14C203
L3	ELQSA56R	T4	RL12C157
L4	ELL5A53R	T5	RL14C203
L5	RLF2D48	T6	RL12C257
L6	ELL10P44	T7	RL14C504
L7	ELQ4C1	T8	RL14C505
L9	ELM10S191	T9	RL12C457
L10	ELM10S191	T10	RLM1C4
L11	QLB0141	T11	RLM1C2
L12	QLH101	T12	RLM1C5
L13	QLH101	T13	QLA0118
L15	ELQ4C1	T14	QLA0118
L16	ELQ4C1	T15	QLP0116
T1	RL14B152	T16	QLP0527US

MISCELLANEOUS

ITEM	NAME	PART NO.
E1	Head, Record/Play	WY425Z
E2	Head, Erase	WY235X
E3	Speaker, Woofer	EAS16PL84SA
E4	Speaker, Tweeter	EAS65PH345B
E5	P.C. Board, Audio	QE10272
E6	P.C. Board, Oscillator	QE10254
E7	P.C. Board, RF	QE10255S
E8	P.C. Board, IF	QE10273
E10	Meter, Level Indicator	QSL0064
M2	Belt, Tape Counter	QDB0125
M47	Motor, Tape Drive	QDM0968
M59	Belt, Flywheel	QDBK0005
S1	switch, Function	ESRE366L25Z
S2	Switch, Record/Play	QSS1106
S3	Switch, AFC	QSTO014S
S4	Switch, Stereo/Mono	QSTO014S
S5	Switch, Speaker	QSTO014S
S6	Switch, Play	QSB0117
S7	Switch, Motor	QSB0170A
S9	Switch, Power	QSW0104US
S10	Switch, Pause	QSS1072

CABINET PARTS

NAME	PART NO.
Assembly, Main Cabinet	QYJ1214
Assembly, Bottom Case	QYC0115
Assembly, Top Cover	QYA0119
Assembly, Front Panel	QYP0239
Assembly, Cassette Panel	QYP0240
Board, Back	QKS1029
Knob, Volume	QYT0196
Knob, Tuning	QYT0195
Knob, Selector	QGT3015
Assembly, Cassette Button	QYT0114
Cabinet, Speaker	QYJ1215

SEPARATION ALIGNMENT

EQUIPMENT REQUIRED

Stereo Modulator.....Connect Stereo Modulator output to EXT Mod. terminal of signal generator.
Signal Generator .....Modulation Rate by 19 kHz Pilot Signal.....8～10%
Modulator Rate by Left Signal.....27%
Output Level .....60 dB
Oscilloscope
Dummy Antenna
VTVM
Low pass Filter

PROCEDURE

Tuner .....Selector switch to "FM STEREO", Dial setting to approx. 98 MHz. AFC switch to "OFF". Tone control to "TREBLE". Balance control to "CENTER". Adjust volume control so that output level from both units becomes equal.

ITEM	SIGNAL SOURCE CONNECTION	EQUIPMENT CONNECTION	ADJUSTMENT	REMARKS
Adjustment of pilot signal.	98 MHz, 30 dB Fig. 20	TP5 Fig. 20	T10 T11 T12	* Set stereo (L+R) modulation to zero. * Measure pilot signal only, and adjust for maximum.
Adjustment of separation.	98 MHz, 60 dB modulation by L signal. Fig. 21	Connect VTVM and 8Ω resistor to ext. sp. jack. Fig. 21	T10 VR1	* Adjust VR control so that CH1 output becomes 0.63 V. * Slightly adjust T10 so that this output becomes maximum. * Modulate signal source by R signal only, and adjust semi-fixed volume VR1 so that CH1 output becomes minimum. * Likewise modulate by L signal only, and adjust VR1 so that CH2 output becomes minimum.
Measurement of stereo eye lighting level.	98 MHz Fig. 20	- -	-----	* Adjust output of signal generator, and make sure that stereo eye lights at 13～30 dB.

Note: When aligning, remove line cord antenna attached to external FM antenna terminal.

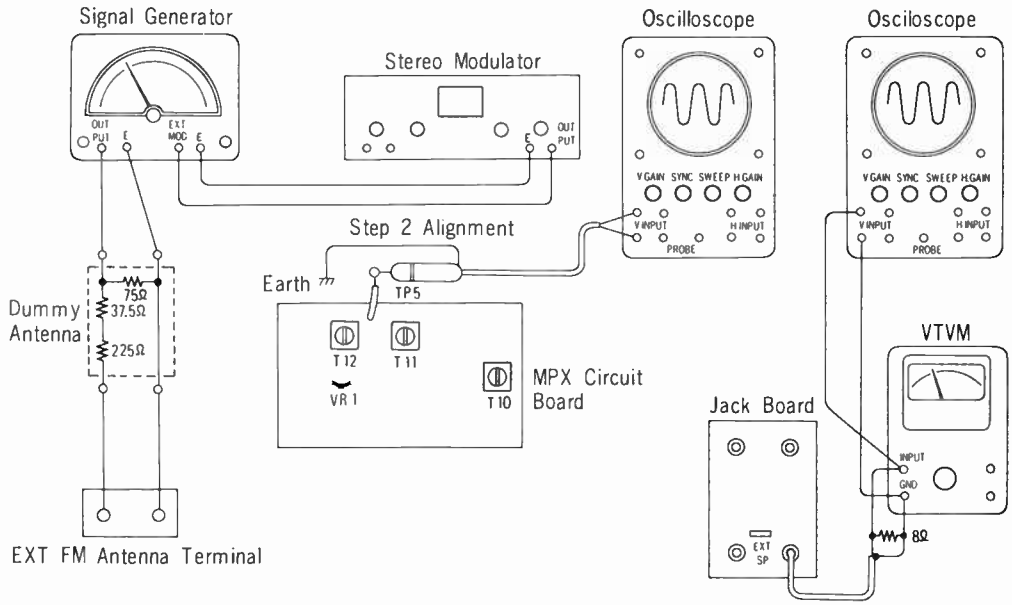


Fig. 20 Recommended Equipment Connection for Multiplex Coil Alignment

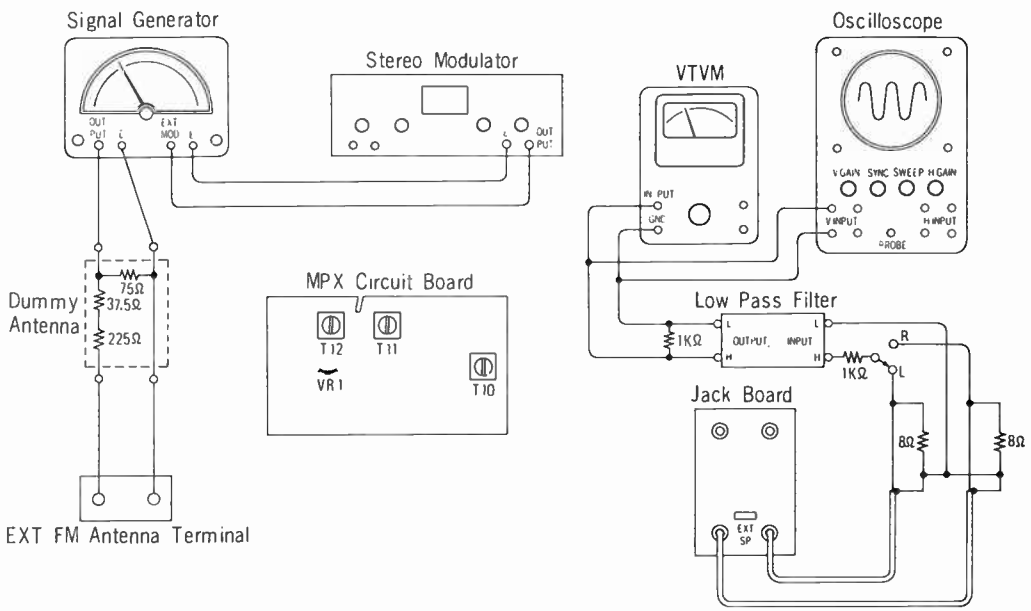
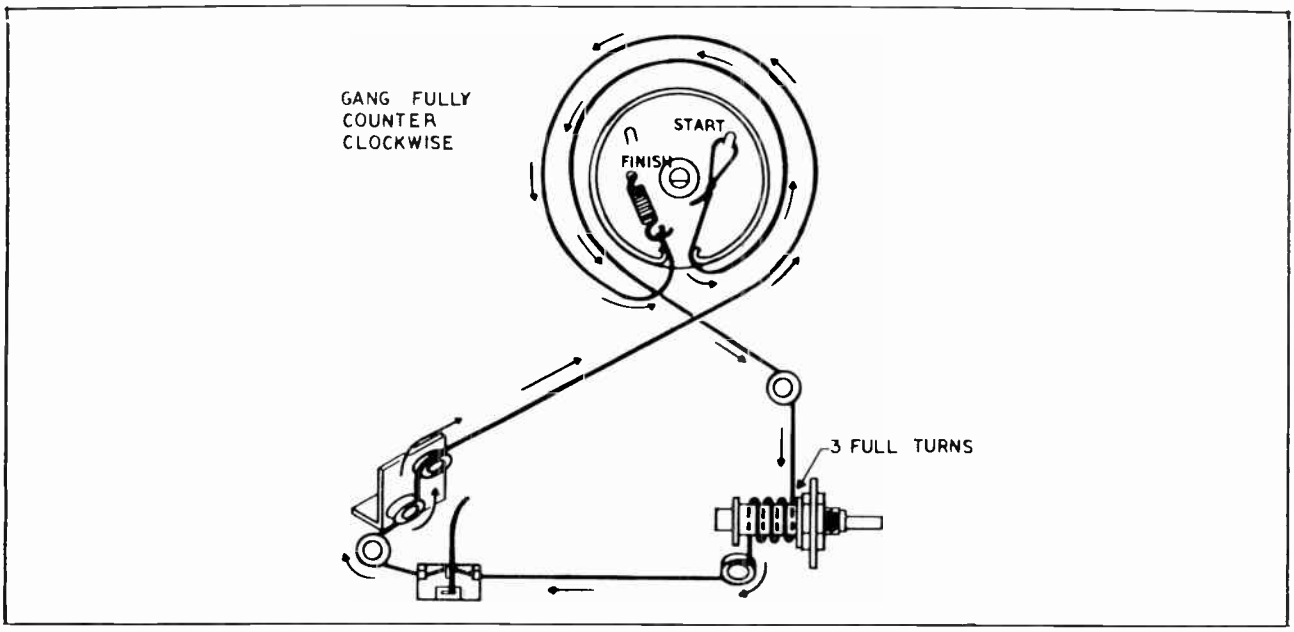
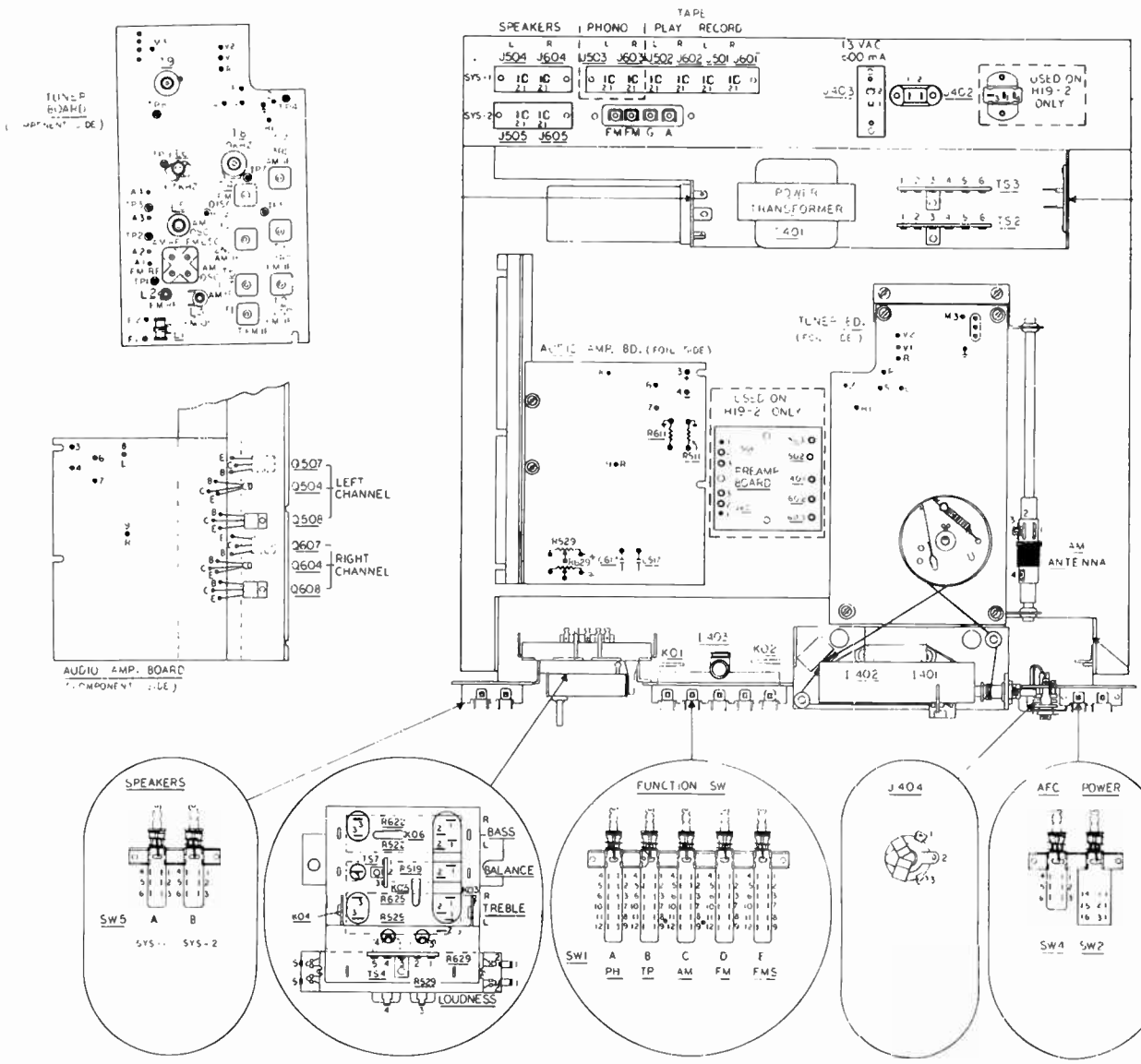
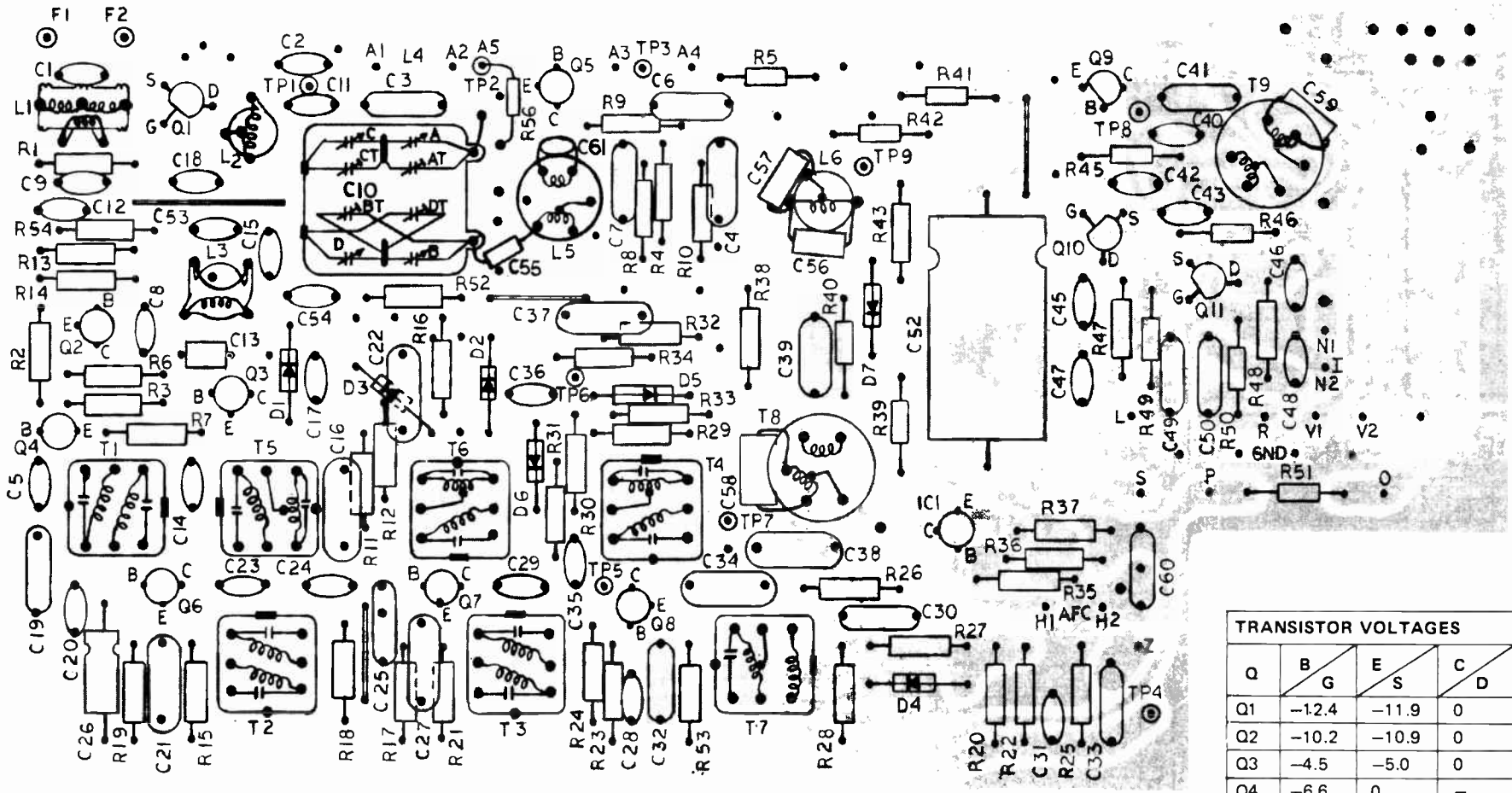


Fig. 21 Recommended Equipment Connection for Separation Alignment

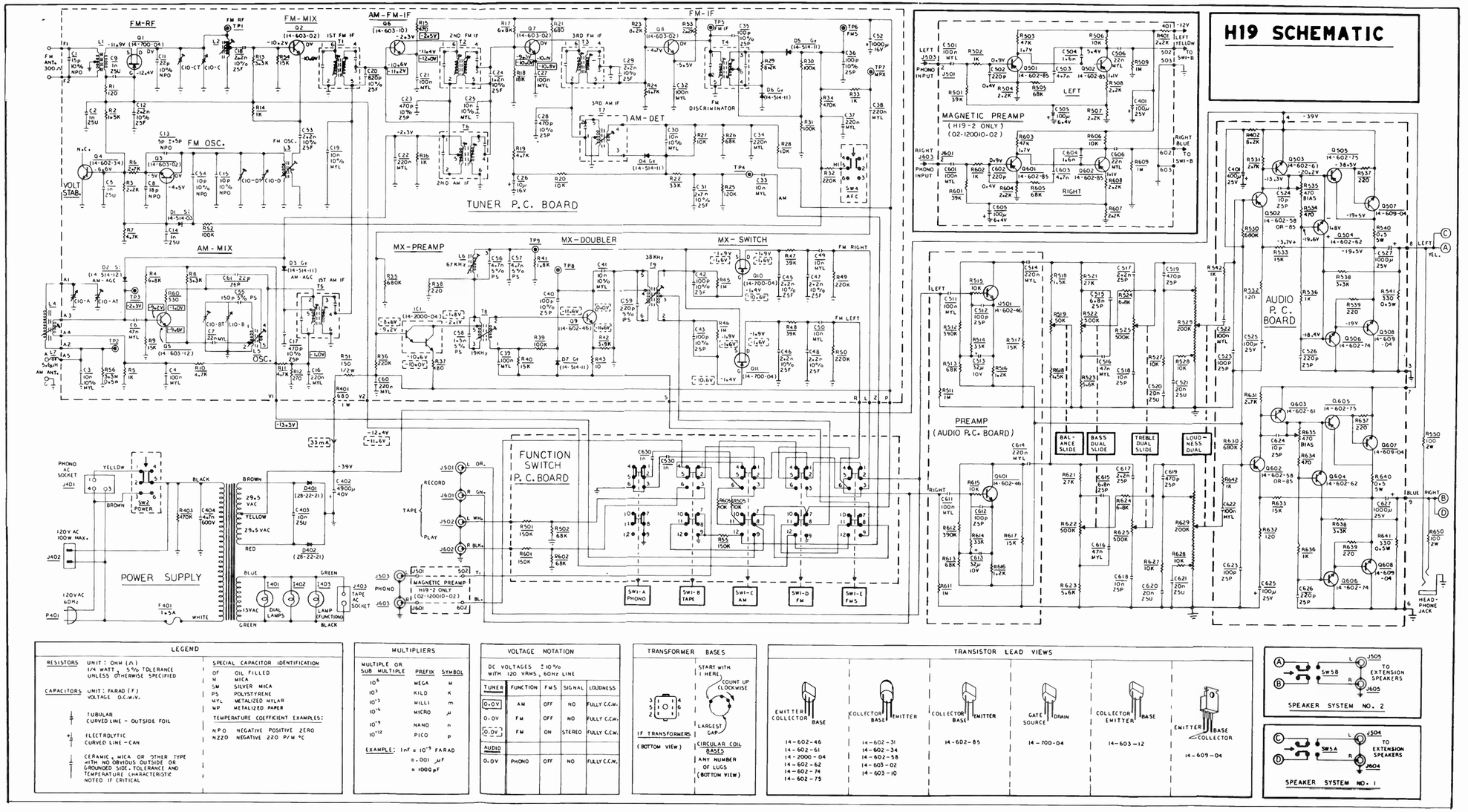




TUNER COMPONENT LAYOUT



TRANSISTOR VOLTAGES				
Q	B / G	E / S	C / D	FUN.
Q1	−12.4	−11.9	0	FM
Q2	−10.2	−10.9	0	FM
Q3	−4.5	−5.0	0	FM
Q4	−6.6	0	–	FM
Q5	−9.2	−9.6	−1.0	AM
Q6	−10.6	−11.4	−2.3	FM
Q7	−9.3	−10.1	0	FM
Q8	−4.7	−5.5	0	FM
Q9	−11.6	−11.6	0	FMS
Q10	−10.6	−1.6	−1.6	FMS
Q11	−10.6	−1.6	−1.6	FMS
IC1	−9.2	−10.6	−2.1	FM



LEGEND

RESISTORS — UNIT: OHM (Ω)
1/4 WATT, 5% TOLERANCE
UNLESS OTHERWISE SPECIFIED

CAPACITORS — UNIT: FARAD (F)
VOLTAGE D.C.W.V.

TUBULAR
CURVED LINE - OUTSIDE FOIL

ELECTROLYTIC
CURVED LINE - CAN

CERAMIC, MICA OR OTHER TYPE WITH NO OBVIOUS OUTSIDE OR GROUNDED SIDE. TOLERANCE AND TEMPERATURE CHARACTERISTIC NOTED IF CRITICAL

SPECIAL CAPACITOR IDENTIFICATION

OF	OIL FILLED
M	MICA
SM	SILVER MICA
PS	POLYSTYRENE
MYL	METALIZED MYLAR
MP	METALIZED PAPER

TEMPERATURE COEFFICIENT EXAMPLES:

NPO	NEGATIVE POSITIVE ZERO
N220	NEGATIVE 220 P/M °C

MULTIPLIERS

MULTIPLE OR SUB MULTIPLE	PREFIX	SYMBOL
10^6	MEGA	M
10^3	KILO	K
10^{-3}	MILLI	m
10^{-6}	MICRO	μ
10^{-9}	NANO	n
10^{-12}	PICO	p

EXAMPLE: $1nF = 10^{-9}$ FARAD
$= .001\ \mu F$
$= 1000\ pF$

VOLTAGE NOTATION

DC VOLTAGES ±10% WITH 120 VRMS, 60HZ LINE

TUNER	FUNCTION	FM5	SIGNAL	LOUDNESS
0.0V	AM	OFF	NO	FULLY C.C.W.
0.0V	FM	OFF	NO	FULLY C.C.W.
0.0V	FM	ON	STEREO	FULLY C.C.W.
AUDIO				
0.0V	PHONO	OFF	NO	FULLY C.C.W.

TRANSFORMER BASES

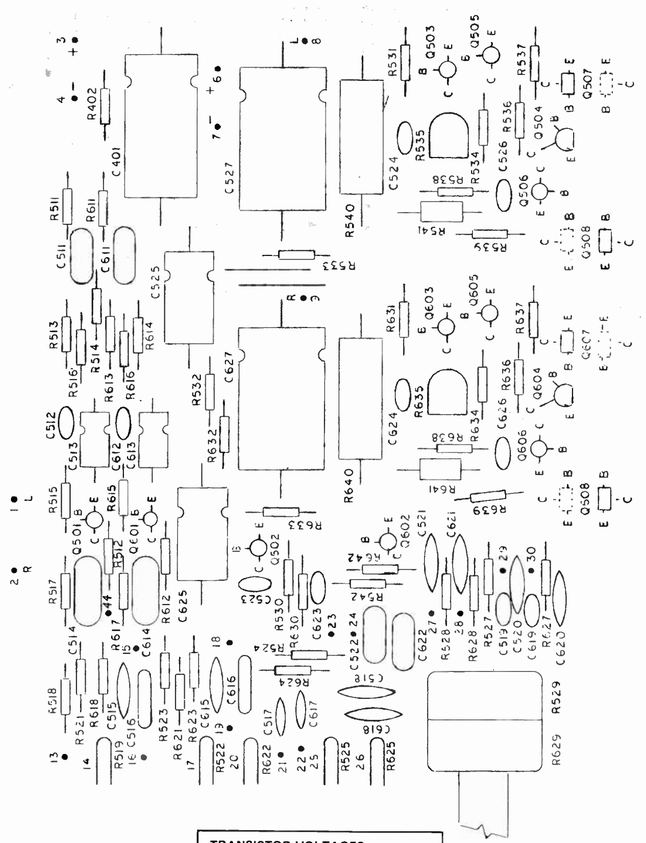
IF TRANSFORMERS (BOTTOM VIEW)

START WITH 1 HERE, COUNT UP CLOCKWISE, LARGEST GAP

CIRCULAR COIL BASES
ANY NUMBER OF LUGS
(BOTTOM VIEW)

TRANSISTOR LEAD VIEWS

EMITTER COLLECTOR BASE	COLLECTOR BASE EMITTER	COLLECTOR BASE EMITTER	GATE SOURCE DRAIN	COLLECTOR EMITTER BASE	EMITTER BASE COLLECTOR
14-602-46 14-602-61 14-2000-04 14-602-62 14-602-74 14-602-75	14-602-31 14-602-34 14-602-58 14-603-02 14-603-10	14-602-85	14-700-04	14-603-12	14-609-04



TRANSISTOR VOLTAGES PHONO FUNCTION NO SIGNAL				
LEFT	RIGHT	B	E	C
501	601	- 23.2	- 23.8	- 13.0
503	603	- 38.3	- 39.0	- 20.2
504	604	- 19.6	- 20.2	- 18.4
507	607	- 38.5	- 39.0	- 19.5
508	608	- 19.0	- 19.5	0

AUDIO AMPLIFIER COMPONENT LAYOUT

ALIGNMENT INSTRUCTIONS

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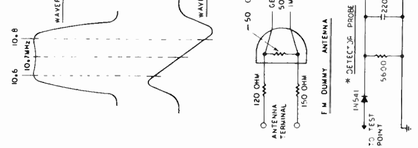


AM IF

Step	Dummy Antenna	Signal Frequency	Signal Applied to	Function Switch Setting	Dial Setting	Indicator	Adjust	Remarks
1	0.1uF	455 KHz 400 Hz, 30%	TP #3	AM	600 KHz	AC VTVM Across TP #4 Coupling Capacitor 10nF	T7 2nd IF T5, T6 & Bottom T5 Top & Bottom	Adjust for maximum indication, set gen. output to keep indicator reading below 50 mV.
AM RF								
2	Heathline Loop	600 KHz	Radiated to Ferrite Loop	Same	Same	Same	L5 Osc. Ferrite Loop	Same
3	Same	1400 KHz	Same	Same	1400 KHz	Same	Trimmers C10 & C10 – AT	Same
Repeat Steps 2 & 3 until no further improvement can be made.								
FM IF SWEEP ALIGNMENT								
4	0.1uF	10.7 MHz No modulation AM	TP #1	FM	Point of no Interference	DC VTVM thru Det. Probe to TP #5	T1 Top & Bottom T4 Bottom Slug T2 Top & Bottom T3 Top & Bottom	Adjust for maximum indication, set gen. output to keep indicator reading below 0.5 V.
5	Same	Same	Same	Same	Same	DC VTVM Det. Probe to TP #6	T4 Top Slug	Adjust for zero D.C. Volts
FM IF SWEEP ALIGNMENT								
4a	Same	10.4 to 11 MHz Sweep	Same	Same	Same	Scope thru Det. probe* to TP #5	T4 Bottom Slug T3, T2 & T1 Top & Bottom Slugs	Adjust for Waveform A
5a	Same	Same	Same	Same	Same	Scope to TP #6	T4 Top Slug	Adjust for Waveform B
FM RF 400Hz 22.5KHz DEVIATION								
6	FM Dummy Ant.	98 MHz	FM Ant. Terminal	Same	98 MHz	AC VTVM TP #5	L3, L2	Adjust for maximum indication.
7	Same	104 MHz	Same	Same	104 MHz	Same	Trimmers C10 DT C10GT	Adjust for maximum indication.
Repeat Steps 6 & 7 until no improvement can be made.								
MULTIPLEX ALIGNMENT								
8	–	67 KHz 6.5 V rms 600 ohm	TP #7	FMS	Point of no Interference	AC VTVM to TP #8	L6, 67 KHz	Adjust for minimum indication
9	–	FM multiplex generator modulated by 19 KHz pilot.	FM Antenna	FMS	Same	AC VTVM to TP #8	T8, T9	Adjust for maximum indication, set gen. output level as low as possible.
10		FM MPX gen. modulated by MPX composite sig. – right channel.	Same	FMS	Same	AC VTVM to Right Channel	T8, 19 KHz	Adjust for maximum indication and minimum right channel indication on left channel.
FM STEREO "ON THE AIR" ALIGNMENT								
11	Good outside ant.	Local FM Stereo Station	FM Antenna Terminal	FMS	Tune to local FM Stereo Station	Listen to one-channel modulation	T8, T9	Adjust for maximum on desired channel & minimum on the other

N.B. Audio output leads, power transformers, A.C. line leads should be kept away from ferrite rod and input of the tuner at least 4".

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	14-514-03	1N43182AFC
D2	14-514-12	
D3	14-514-11	1N542(P)
D4	14-514-11	1N542(P)
D5	14-514-11	1N542(P)
D6	14-514-11	1N542(P)
D7	14-514-11	1N542(P)
D401	28-22-21	
D402	28-22-21	
IC1	14-2000-04	
	(14-2000-05)	
Q1	14-700-04	T1S88
Q2	14-603-02	SE5006
Q3	14-603-02	SE5006
Q4	14-602-34	S1891B
Q5	14-603-12	BF255
Q6	14-603-10	SE5006 (Selected)
Q7	14-603-02	SE5006
Q8	14-603-02	SE5006
Q9	14-602-46	BC169C
Q10	14-700-04	T1S88
Q11	14-700-04	T1S88
Q501	14-602-46	BC169
Q502	14-602-58	
	(14-602-85)	2S4612 (2C1007)
Q503	14-602-61	T1S95
Q504	14-602-62	T1-1A6
Q505	14-602-75	2A12
Q506	14-602-74	1S38
Q507	14-609-04	
Q508	14-609-04	
Q601	14-602-46	BC169
Q602	14-602-58	
	(14-602-85)	S24612 (2C1007)
Q603	14-602-61	T1S95
Q604	14-602-62	T1-1A6
Q605	14-602-75	2A12
Q606	14-602-74	1S38
Q607	14-609-04	
Q608	14-609-04	

(MAGNETIC CARTRIDGE PREAMP)

Q501	14-602-85	2C1007
Q502	14-602-85	2C1007
Q601	14-602-85	2C1007
Q602	14-602-85	2C1007

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE	
C26	44-110005-03	10mfd	16V
C52	44-110205-17	100mfd	16V
C401	44-147106-17	470mfd	25V
C513	44-133004-27	33mfd	10V
C525	44-110106-06	100mfd	25V
C527	44-110206-18	1000mfd	25V
C613	44-133004-27	33mfd	10V
C625	44-110106-06	100mfd	25V
C627	44-110206-18	1000mfd	25V
	45-68-01	Tuning Gang	

(MAGNETIC CARTRIDGE PREAMP)

C401	44-110106-06	100mfd	25V
C505	44-110103-05	100mfd	6.4V
C605	44-110103-05	100mfd	6.4V

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R519	41-275-01	50K Balance
R522 & R622	41-276-02	500K Dual Bass
R525 & R625	41-276-02	500K Dual Treble
R529 & R629	41-279-02	200K Dual Volume
R535	41-625-01	470 ohm Bias
R540	42-41-01	.51 ohms 5% 5W
R635	41-625-01	470 ohm Bias
R640	42-41-01	.51 ohms 5% 5W

COILS/TRANSFORMERS

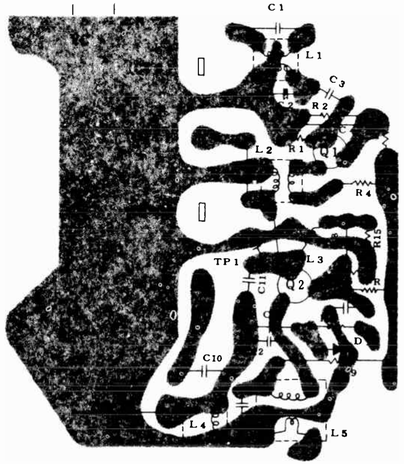
ITEM	PART NO.
L1	21-638-02
L2	21-653-01
L3	21-654-01
L4	21-652-02
L5	21-622-03
L6	21-607-07
L7	21-1400-03 (21-1400-09)
T1	21-646-01
T2	21-646-02
T3	21-646-02
T4	21-647-01
T5	21-648-01
T6	21-648-01
T7	21-649-01
T8	21-628-04
T9	21-625-05
Power	24-10153-02

MISCELLANEOUS

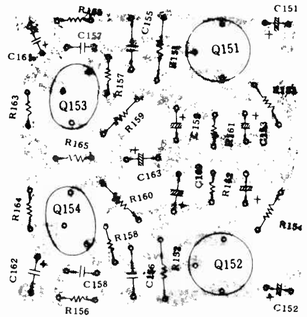
ITEM	NAME	PART NO.
SW1	Switch, Function	26-203-28
SW2	Switch, Power	26-203-29
SW4	Switch, AFC	26-203-29
SW5	Switch, Speakers	26-203-04
	Fuse, 1.5A	27-14-12
	P.C. Board, Tuner	02-70142-10
	P.C. Board, Audio	02-120005-02
	P.C. Board, Function Switch	02-120004-01
	P.C. Board, Mag Cartridge Preamp	02-120010-02
	Speaker, 3-1/2" Tweeter (Model SC421)	19-30006-07
	Speaker, 6" (Model SC421)	19-60008-22
	Assembly, Changer (Model SC421) (Garrard 5-300)	16-90060-01
	Assembly, Changer (Model SC430) (Dual 1214)	16-90062-03
	Cartridge, Phono (Model SC421) (Astatic 207D)	16-250037-04
	Cartridge, Phono (Model SC430) (Shure M75-6S)	16-250043-01
	Stylus, Phono (Model SC421) (Astatic N17SD)	16-120064-13
	Stylus, Phono (Model SC430) (Shure N75-6)	16-120080-01

CABINET PARTS

NAME	PART NO.
Panel, Control	30-429-01
Scale, Dial	30-430-01
Knob, Bass	53-1261-01
Knob, Treble	53-1261-01
Knob, Balance	53-1261-01
Knob, Loudness	53-1261-02
Knob, Tuning	53-1295-01
Button, Function	53-1296-01
Button, Power	53-1296-02
Button, AFC	53-1296-02
Button, Speaker System 1	53-1296-03
Button, Speaker System 2	53-1296-04
Cover, Dust	53-1284-01



RF BOARD (BOTTOM VIEW)

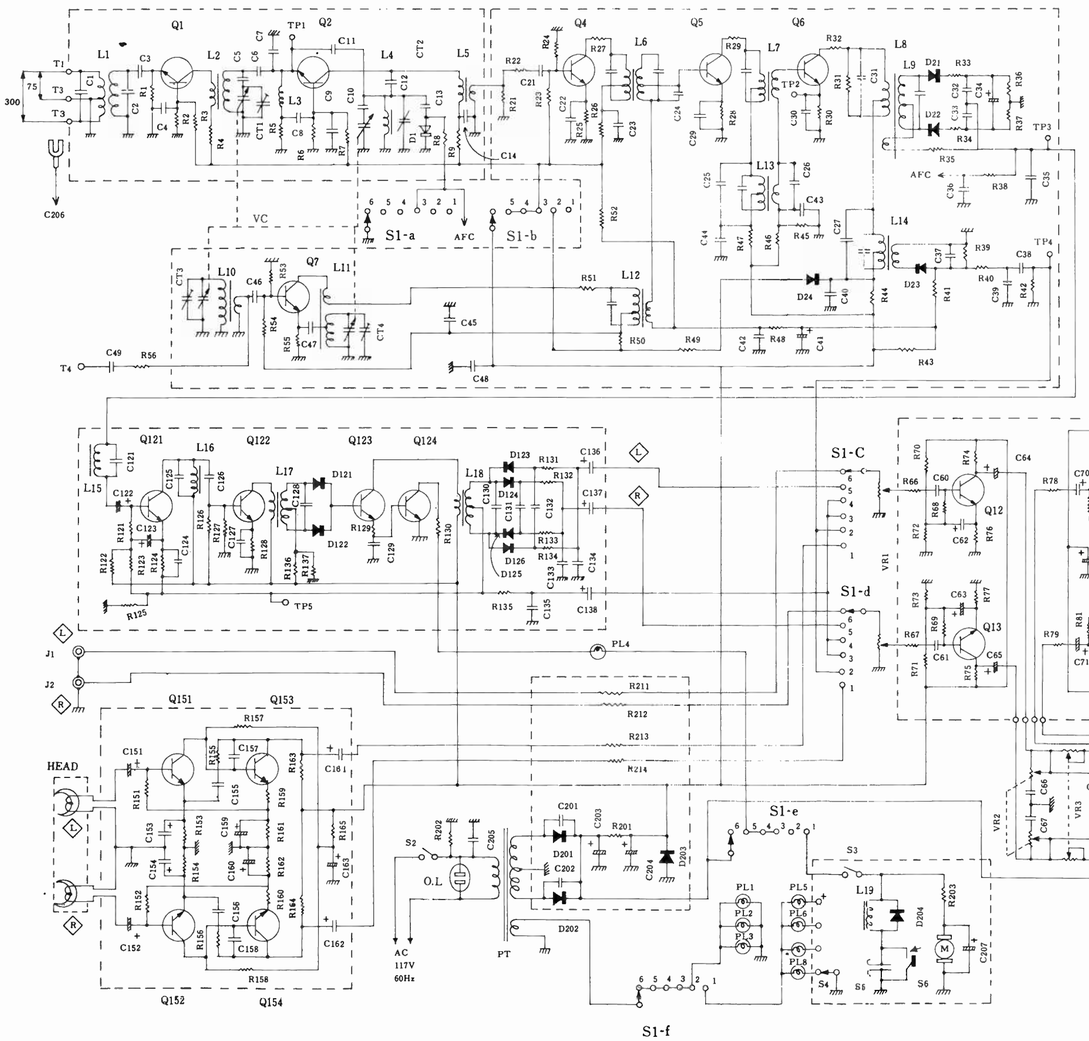


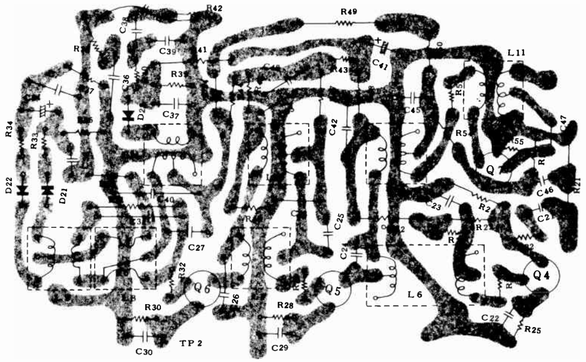
HEAD PRE-AMP BOARD
(BOTTOM VIEW)

VOLTAGE CHART

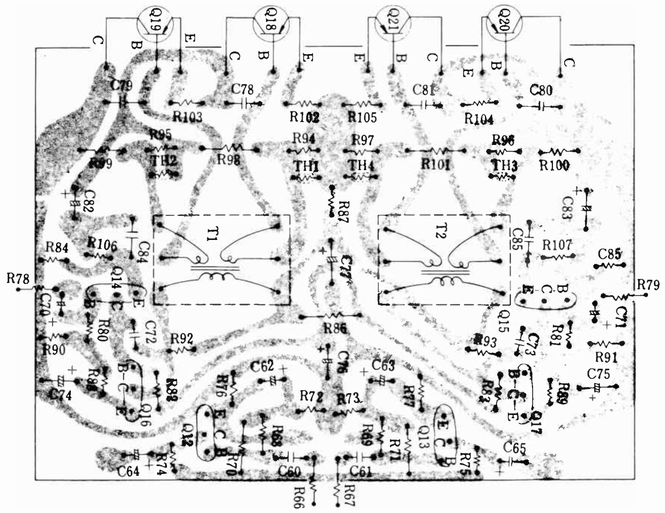
	V_c	V_b	V_e
Q1*	10.2	2.1	1.3
Q2*	10.2	2.6	2.1
Q4*	9.9	2.2	1.6
Q5*	9.6	1.7	1.0
Q6*	7.8	3.5	2.8
Q7	10.0	1.6	1.0
Q12	5.6	.76	.23
Q13	5.6	.76	.23
Q14	2.2	.78	.15
Q15	2.2	.78	.15
Q16	7.9	2.2	1.5
Q17	7.9	2.2	1.5
Q18	8.5	17.4	17.5
Q19	0	8.4	8.5
Q20	0	8.4	8.5
Q121	10.2	4.5	3.9
Q122	10.2	1.9	1.3
Q123	10.2	1.0	.54
Q124	17.5	.56	0
Q151	1.3	.6	.03
Q152	1.3	.6	.03
Q153	5.3	1.3	.7
Q154	5.3	1.3	.7

Measurements taken with VTVM to chassis ground with 120V line voltage. No signal. (*)Switch in FM position. All others in AM position.





IF BOARD (BOTTOM VIEW)



AUDIO AMP BOARD (BOTTOM VIEW)

ALIGNMENT PROCEDURE

AM-FM-FM STEREO ALIGNMENT

AM

STEP	SIGNAL GENERATOR		RECEIVER		ADJUST
	CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	**AM SIGNAL GEN.** Loop or piece of wire Placed near AM antenna. (L10)	455KHz 30% 400Hz AM	Tuning gang fully opened. (Min. capacity)	Adjust for max. output on output meter.	L12 L13 L14
2	Same as step 1	525KHz 30% 400Hz AM	Tuning gang fully closed. (Max. capacity)	Same as step 1	L11
3	Same as step 1	1650KHz 30% 400Hz AM	Tuning gang fully opened (Min. capacity)	Same as step 1	CT4
4	Same as step 1	1400KHz 30% 400Hz AM	1400KHz(Tuning)	Same as step 1	CT3
5	Same as step 1	600KHz 30% 400Hz AM	600KHz(Tuning)	Same as step 1	L10
6	Repeat Step 2, 3, 4 and 5 until no further improvement is obtained.				

FM

STEP	SIGNAL GENERATOR		RECEIVER		ADJUST
	CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	
1	**SWEEP GEN.** Signal to TP1 thru a 0.01μF Capacity.	10.7MHz ± 300KHz 10.55, 10.7, 10.85MHz Markers	Tuning gang fully closed. (Max. capacity)	Connect Scope to TP2 Max. gain with Symmetrical curve, centered at 10.7MHz	L5, L6 L7
				Connect Scope to TP3 Symmetrical "S" curve centered at 10.7MHz	L8, L9
2	**FM SIGNAL GEN.** Coupled to FM antenna terminal	87.5MHz 30% 400Hz FM	Tuning gang fully closed. (Max. capacity)	Adjust for max. output on output meter.	L4
3	Same as step 2	109MHz 30% 400Hz FM	Tuning gang fully opened. (Min. capacity)	Same as step 2	CT2
4	Same as step 2	90MHz 30% 400Hz FM	90MHz (Tuning)	Same as step 2	L2
5	Same as step 2	106MHz 30% 400Hz FM	106MHz (Tuning)	Same as step 2	CT1
6	Repeat step 2, 3, 4 and 5 until no further improvement is obtained.				

FM STEREO

STEP	CONNECTION TO RECEIVER	INPUT SIGNAL FREQUENCY	DIAL SETTING	REMARKS	ADJUST
1	**MPX SIGNAL GEN.** L15, thru TP3	67KHz	Free	Connect Scope to TP5 Adjust for min. amplitude on scope	L15
2	**FM SIGNAL GEN.** Coupled to FM antenna terminal	98MHz 1KμV FM Stereo signal modulated 1KHz 45% (Left)	98MHz (Tuning)	Adjust for min. output on output meter (Right)	L16 L17 L18
		Change Left to Right		Adjust for min. output on output meter (Left)	

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	988048	1S48
D21	817125	1N60
D22	817125	1N60
D23	817125	1N60
D24	817125	1N60
D121	817125	1N60
D122	817125	1N60
D123	817125	1N60
D124	817125	1N60
D125	817125	1N60
D126	817125	1N60
D201	988049	1S1941
D202	988049	1S1941
D203	988050	1S1718
D204	988051	FR2
Q1	988000	2SC784
Q2	988001	2SC394
Q4	988002	2SC380A
Q5	988002	2SC380A
Q6	988002	2SC280A
Q7	988002	2SC280A
Q12	988003	2SC732
Q13	988003	2SC732
Q14	983742	2SC372
Q15	983742	2SC372
Q16	983742	2SC372
Q17	983742	2SC372
Q18	988005	2SB415
Q19	988005	2SB415
Q20	988005	2SB415
Q21	988005	2SB415
Q121	988004	2SB372
Q122	988004	2SB372
Q123	983742	2SC372
Q124	988006	2SC735
Q151	988003	2SC732
Q152	988003	2SC732
Q153	988003	2SC732
Q154	988003	2SC732

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE	
C34	984827	5mfd	6V
C38	988254	.2mfd	10V
C41	981160	1mfd	6V
C62	985550	10mfd	6V
C63	985550	10mfd	6V
C64	985550	10mfd	6V
C65	985550	10mfd	6V
C70	985550	10mfd	6V
C71	985550	10mfd	6V
C74	987015	100mfd	10V
C75	987015	100mfd	10V
C76	987015	100mfd	10V
C77	987749	200mfd	16V
C82	985082	470mfd	16V
C83	985082	470mfd	16V
C122	985550	10mfd	6V
C123	985550	10mfd	6V
C129	981160	1mfd	6V
C136	988254	.2mfd	10V
C137	988254	.2mfd	10V
C138	988254	.2mfd	10V
C151	984218	30mfd	6V
C152	984218	30mfd	6V
C153	988255	.5mfd	10V
C154	988255	.5mfd	10V
C159	984218	30mfd	6V
C160	988218	30mfd	6V
C161	988254	.2mfd	6V
C162	988254	.2mfd	6V
C163	987015	100mfd	10V
C203	988422	2200mfd	18V
C204	988055	460mfd	18V
C207	987306	100mfd	16V
CT2	988008	12pf	Trimmer
VC	988007	Tuning	Gang

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	VALUE
R102		1 ohm
R103		1 ohm
R104		1 ohm
R105		1 ohm
TH1	988052	Thermistor, D21A
TH2	988052	Thermistor, D21A
TH3	988052	Thermistor, D21A
TH4	988052	Thermistor, D21A
VR1/S2	988041	100K Dual Volume/Switch
VR2	988042	50K Dual Treble
VR3	988043	50K Dual Bass
VR4	988044	50K Balance

COILS/TRANSFORMERS

ITEM	PART NO.		
L1	988017	L12	988028
L2	988018	L13	988029
L3	988019	L14	988030
L4	988020	L15	988031
L5	988021	L16	988032
L6	988022	L17	988033
L7	988023	L18	988034
L8	988024	L19	988035
L9	988025	L20	988036
L10	988026	PT	988046
L11	988027	T1	988045
		T2	988045

MISCELLANEOUS

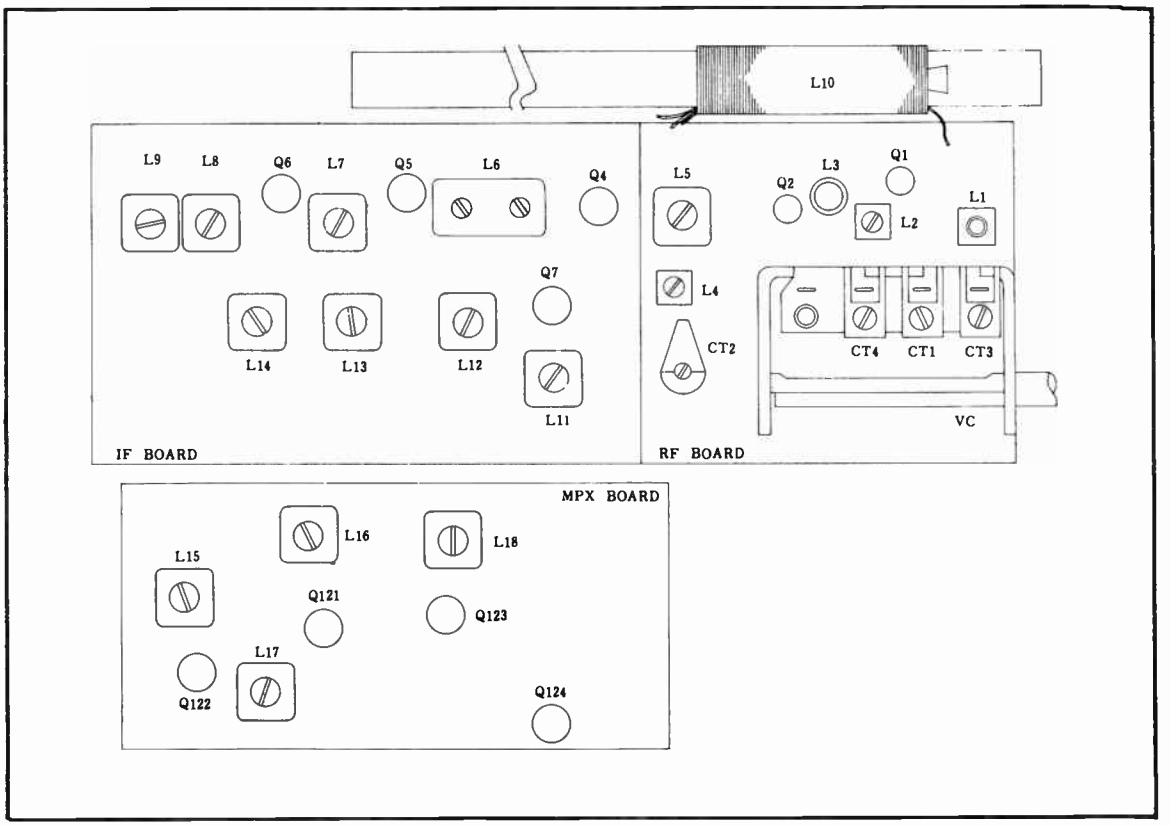
ITEM	NAME	PART NO.
HEAD	Head, Tape	988015
M	Motor, Tape	988016
S1	Switch, Function	988037
S3	Switch, Thrust	988069
S4	Switch, Cam Rachet	988038
S5	Switch, Auto Detent	988039
S6	Switch, Program Selector	988040
	Belt, Tape Drive	988062
	Solenoid	988035
	Speaker, 4-1/2" PM, 8 ohms	988221

CABINET PARTS

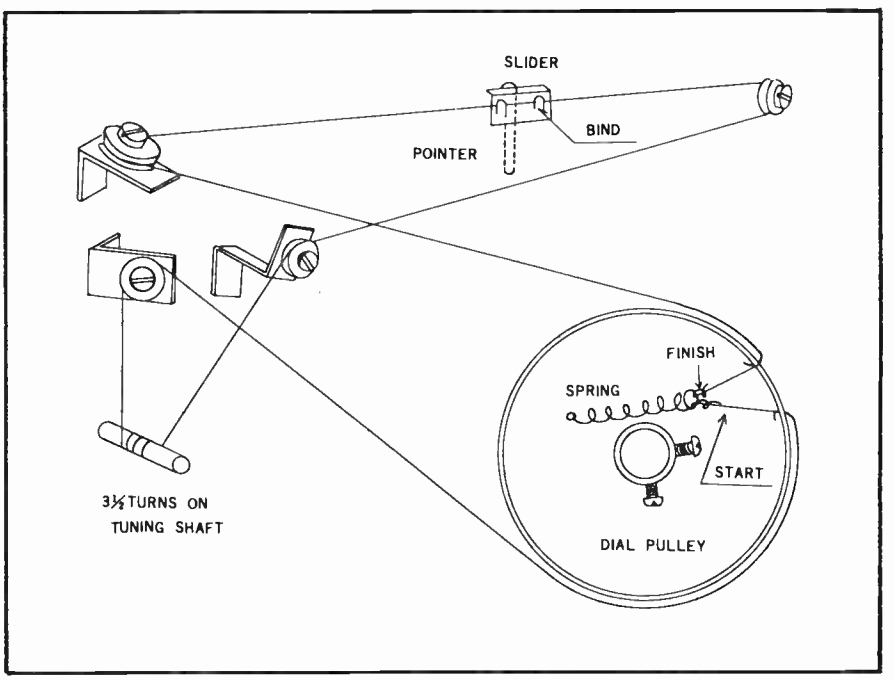
NAME	PART NO.
Assembly, Cabinet	988260
Assembly, Front Panel	988256
Knob, Tuning	988093
Knob, Control	988094
Knob, Program Selector	988313
Cabinet, Speaker (less Front)	988298
Panel, Speaker Front	988299
Panel, Speaker Rear	988301

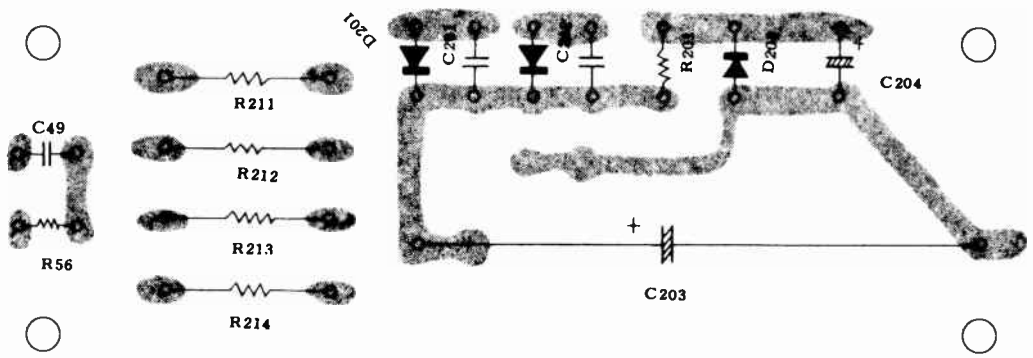
Pages 39-46 Courtesy of EMERSON TV SALES CORP.

TOP VIEW OF CHASSIS WITH ALIGNMENT LOCATIONS

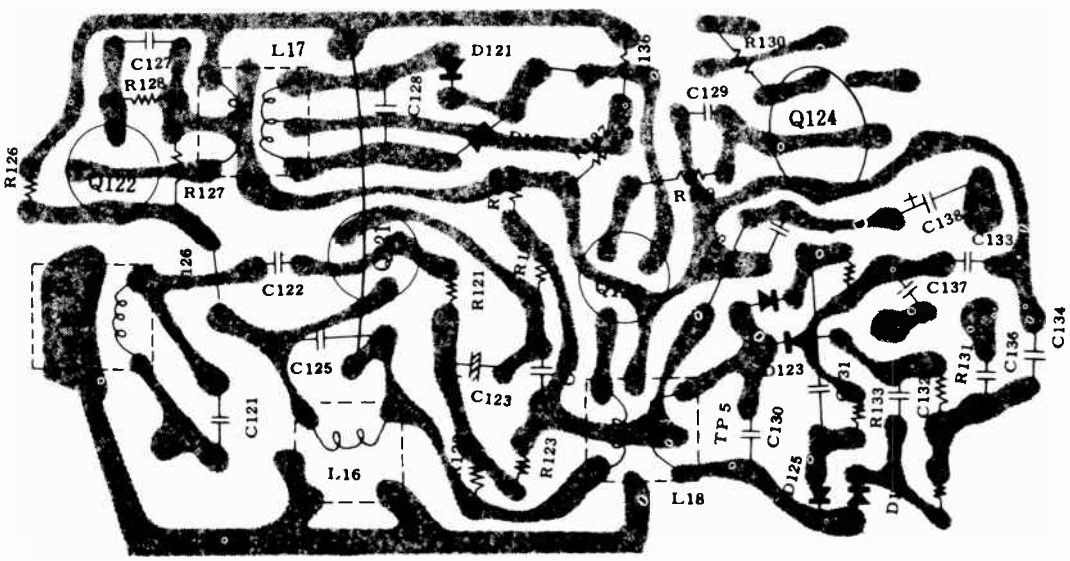


DIAL STRINGING DIAGRAM





POWER SUPPLY BOARD (BOTTOM VIEW)



MPX BOARD (BOTTOM VIEW)

GENERAL ALIGNMENT INSTRUCTION

FM TUNER ALIGNMENT

Steps	Item	Measuring Instrument	Input Terminal	Output Terminal	Frequency	Adjust	Wave Form
1	IF Amplifier	10.7MHz±150kHz Sweep Generator	TP1 (See FM RF BOARD)	TP2 (See AM-IF-FM-IF BOARD)		(A) T103 (top & bottom cores) (B) T201 (top & bottom cores) (C) T202 (top & bottom cores) (D) T203 (top & bottom cores) (E) T204 (bottom core) (F) T204 (top core)	Gain Max., (Fig.4) Gain Max., (Fig.4) Gain Max., (Fig.4) Gain Max., (Fig.4) Gain Max., (Fig.4) (Fig.3)
2	Covering	2.1 FM signal generator 88MHz 400Hz 100% modulated 2.2 FM signal generator 108MHz 400Hz 100% modulated Repeat (2.1) & (2.2)	Antenna terminal Antenna terminal	TAPE OUT TAPE OUT	88MHz (Tune the Dial Pointer at 88MHz) 108MHz (Tune the Dial Pointer at 108MHz)	L103 TC4	Output Max. Output Max.
3	Tracking	3.1 FM signal generator 90MHz 400Hz 100% modulated 3.2 FM signal generator 106MHz 400Hz 100% modulated Repeat (3.1) & (3.2)	Antenna terminal Antenna terminal	TAPE OUT TAPE OUT	90MHz 106MHz	T101, L101 TC1, TC2	Output Max. Output Max.
4	Neutralizing		Antenna terminal	TAPE OUT		TC1, TC2, TC3	Set TC3 as shown in Fig.5 and adjust TC1, TC2 to gain a tracking. Short-circuit the FM antenna terminal to ascertain if the amplitude shown in Fig.5 is occurring on all bands. If it is occurring adjust. TC3 to the point where any amplitude is not occurring to regain tracking and ascertain the amplitude again.
5	Output	FM signal generator 98MHz 400Hz 30% modulated, 60dB at input	Antenna terminal	TAPE OUT	98MHz	VR201	Adjust the output to gain 350mV±2dB.
6	Strength Meter	FM signal generator 98MHz 400Hz 100% modulated, 60dB at input	Antenna terminal	Strength Meter	98MHz	VR204	Adjust VR204 so that pointer of meter will deviate between 4 and 4.5.
7	Tuning Meter			Tuning Meter		T204 (top core)	Set the dial pointer to 98MHz and set the pointer of the tuning meter to the center when there is no input signal.
8	FM Muting	FM signal generator 98MHz 400Hz 100% modulated, 20dB at input	Antenna terminal	TAPE OUT	98MHz	VR205	Adjust VR205 so that a signal can occur then the input signal is 20±6dB.

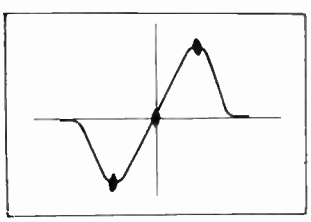


Fig.3

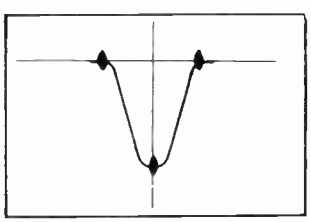


Fig.4

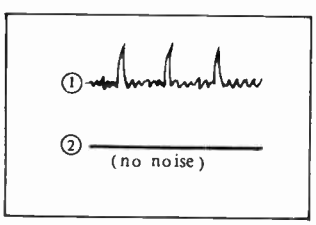
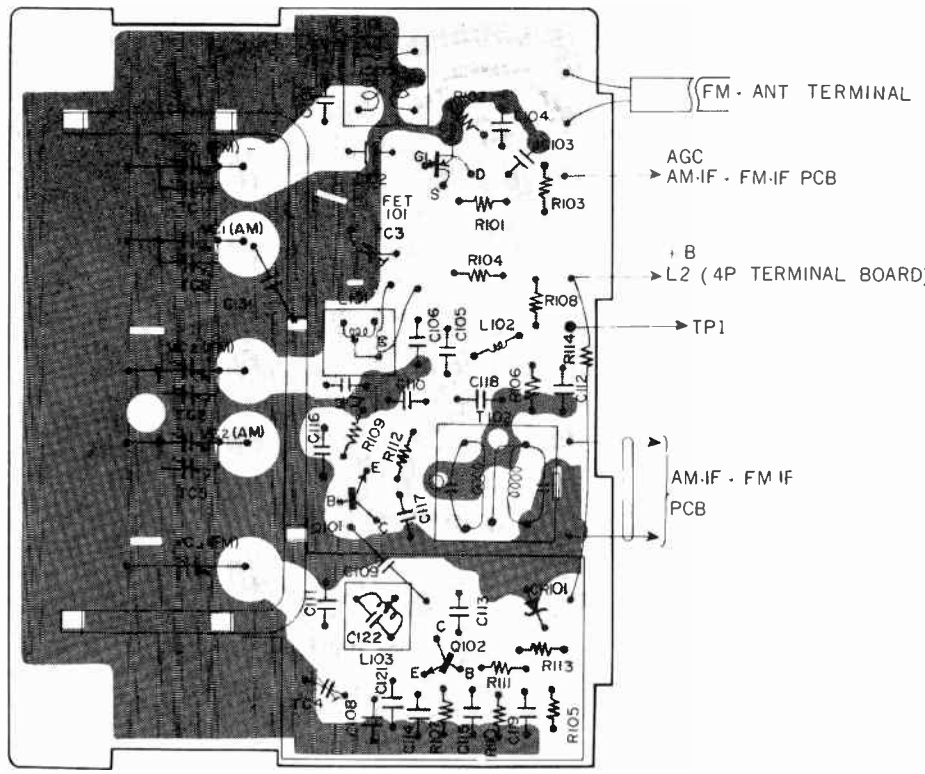


Fig.5

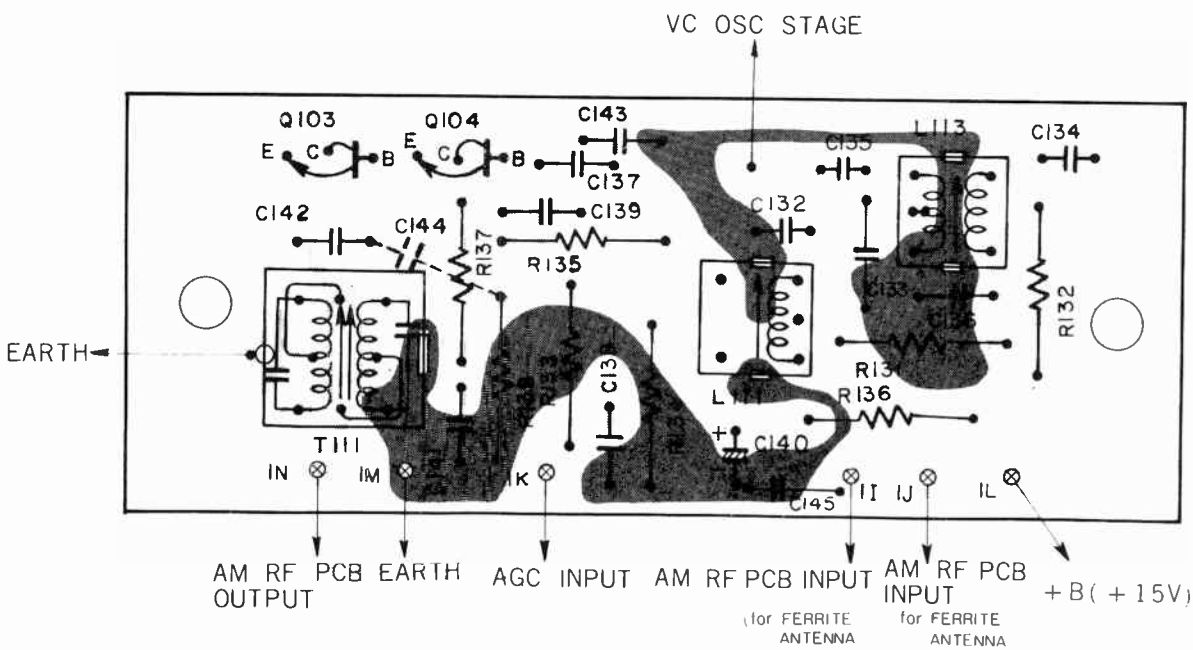
CIRCUIT BOARD

Really on the base-plate, the printed symbol number is shown with two figures, but not all of them. This means the first figure is shortened. When it is needed to know the symbol number, please check the plan of base-plate and circuit in this service-manual.

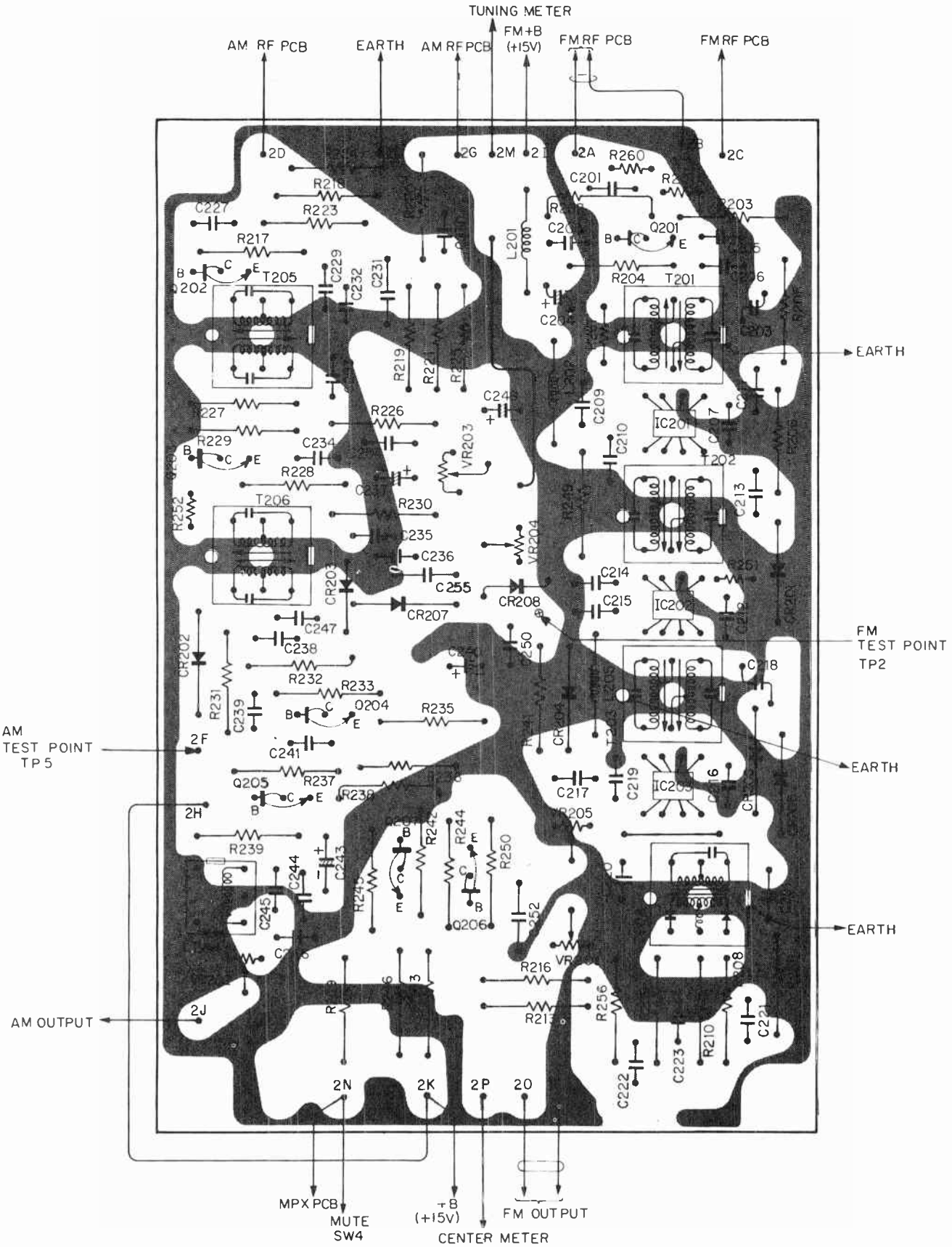
FM RF CIRCUIT BOARD



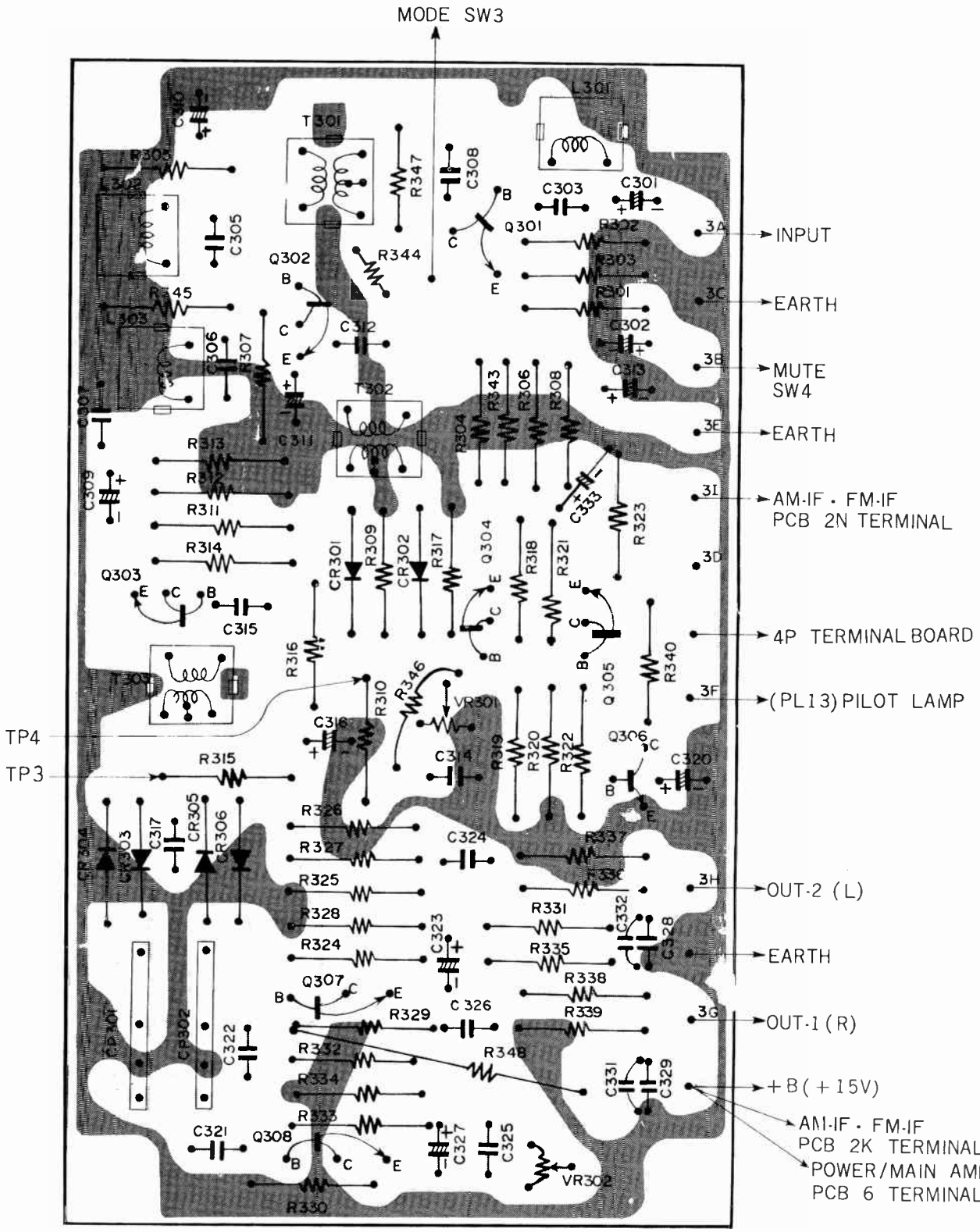
AM RF CIRCUIT BOARD



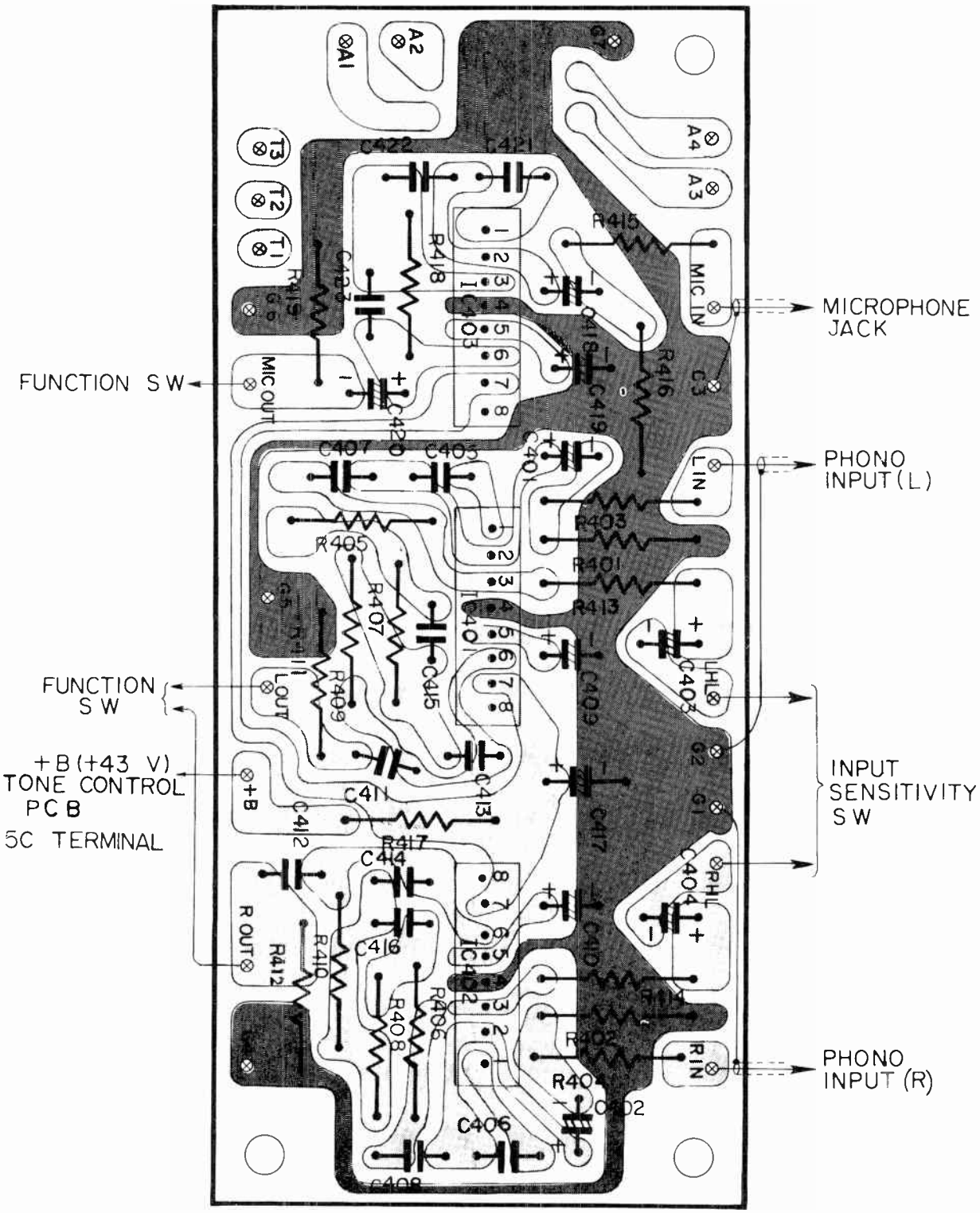
AM-IF·FM-IF CIRCUIT BOARD



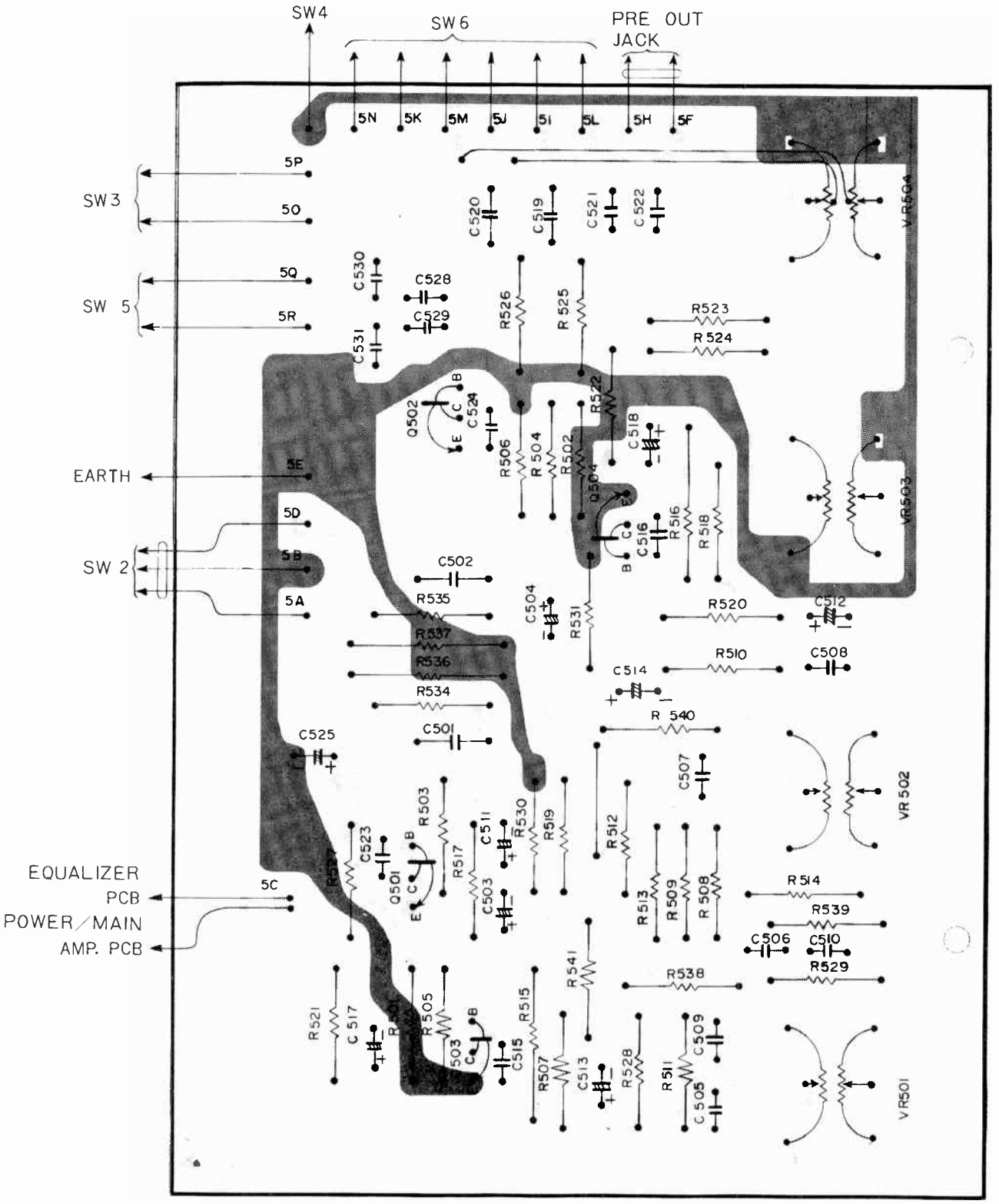
MPX CIRCUIT BOARD



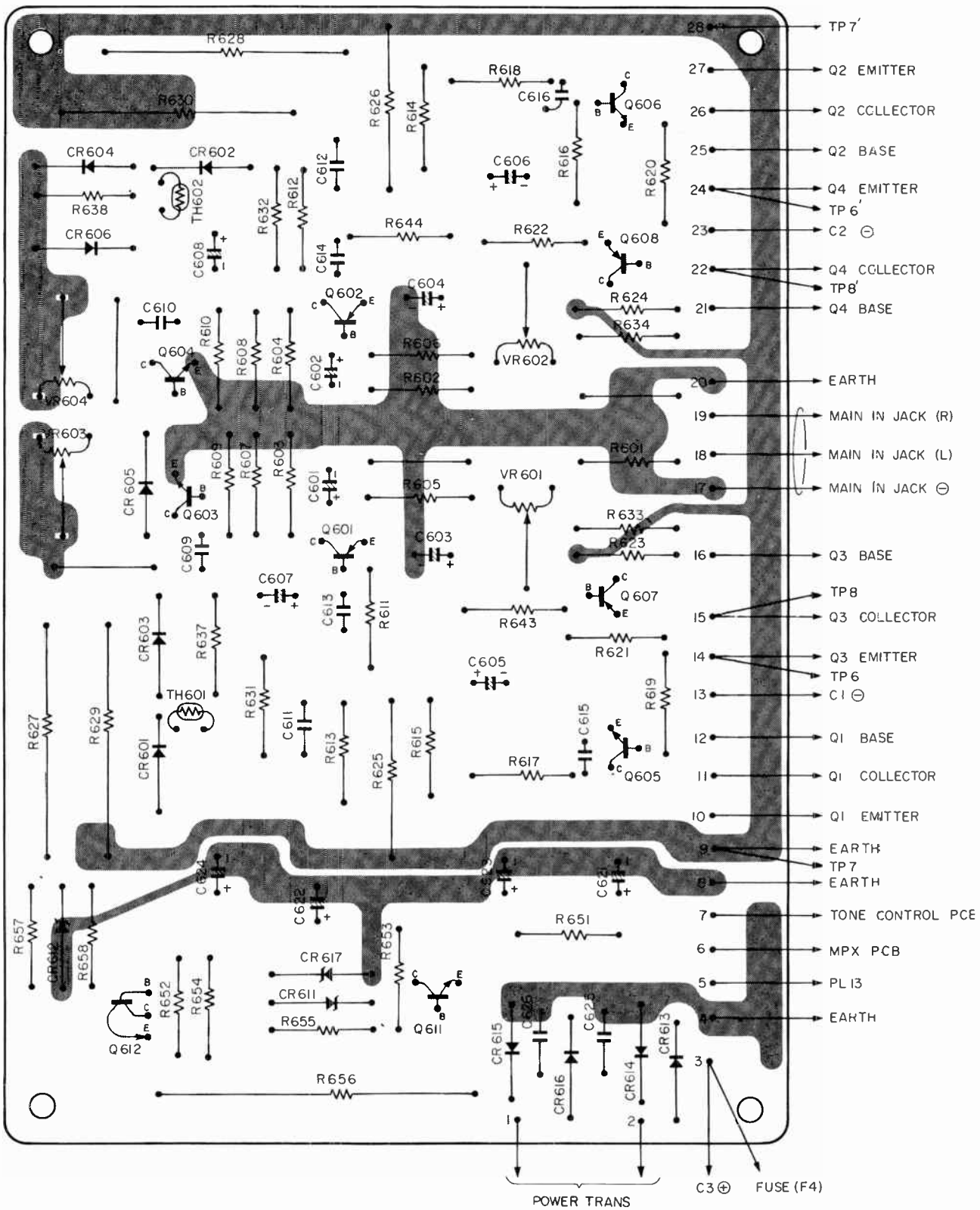
EQUALIZER CIRCUIT BOARD



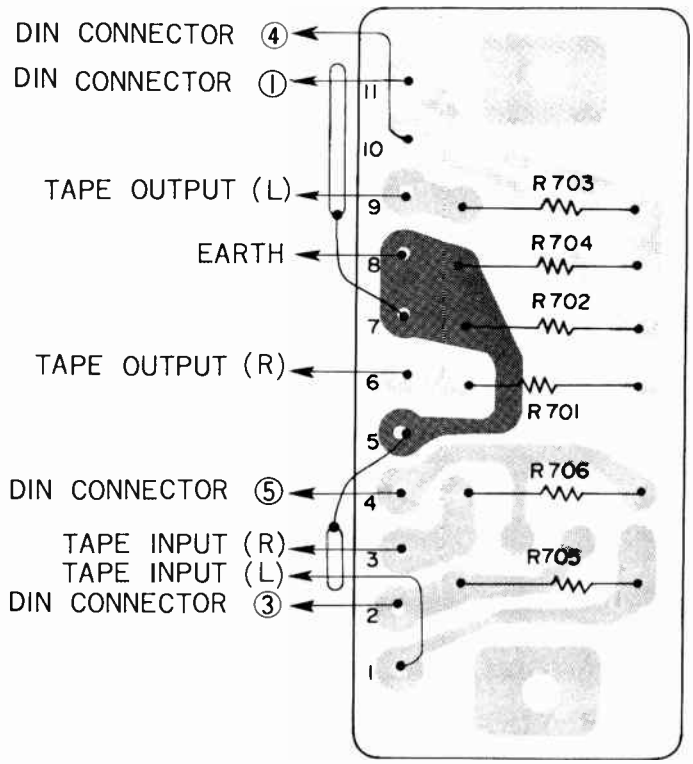
TONE CONTROL CIRCUIT BOARD



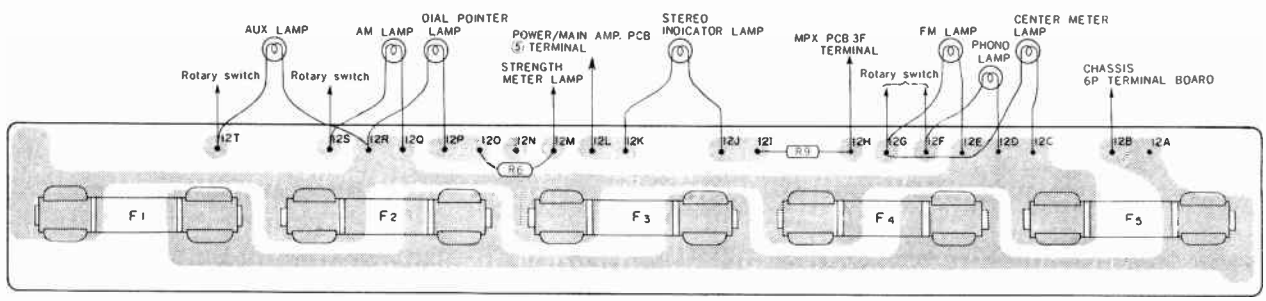
POWER/MAIN AMPLIFIER CIRCUIT BOARD



DIN CIRCUIT BOARD



LAMP HOLDER CIRCUIT BOARD

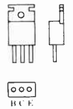


POLARITY OF TRANSISTORS & IC CIRCUIT

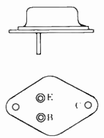
2SC461, 2SC458, 2SC458LG
2SC458ALG, 2SC460, 2SC454
2SA673A, 2SC1213A, 2SC1213
2SC535

2SA537A
2SC708A

2SC1061

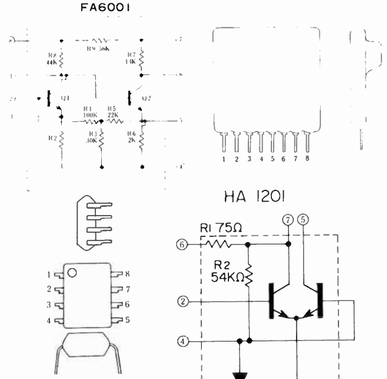


2SC1030

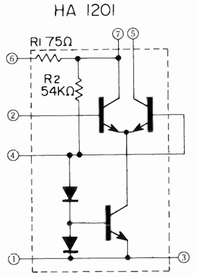


3SK30

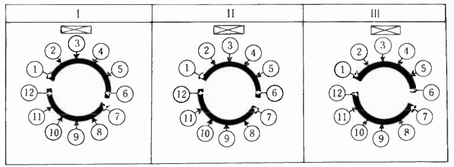
FA6001



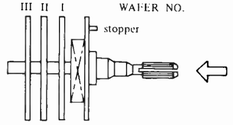
HA 1201



ARRANGEMENT OF ROTARY SWITCHE'S TERMINAL

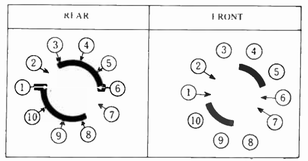


Rotary switch 1

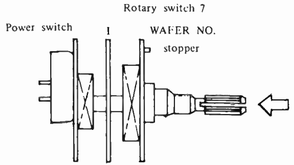


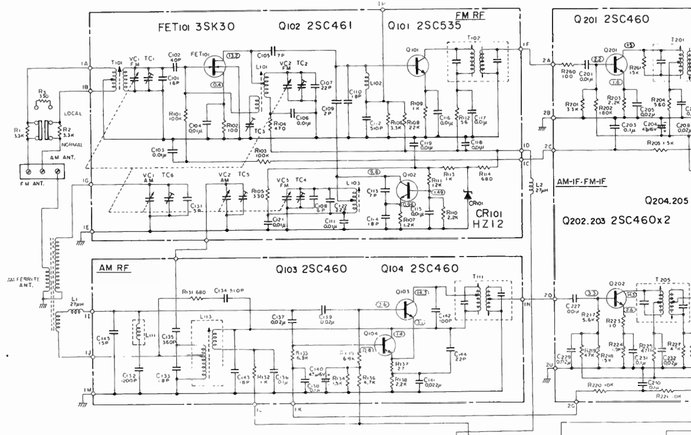
This figure shows the wafer of rotary switch viewed from its front (arrow mark) when it is turned extremely counterclockwise.

⊠ implies the position of stopper.



Rotary switch 7





The circuit diagram is subject change for improvement without notice.

4.2 FM MPX ALIGNMENT

Steps	Item	Measuring Instrument	Input Terminal	Output Terminal	Frequency	Adjust	Wave Form
1	67kHz Trap	FM signal generator 100MHz 67kHz 100% modulated	Antenna terminal	TP3 (See MPX BOARD)	100MHz	L301	Min.
2	71kHz Trap	FM signal generator 100MHz 71kHz 100% modulated	Antenna terminal	TP3 (See MPX BOARD)	100MHz	L302	Min.
3	19kHz Trap	FM signal generator 100MHz pilot signal (19kHz) 8% modulated	Antenna terminal	TP3 (See MPX BOARD)	100MHz	L302	Min.
4	VR301: Turn right to the full.						
5	19kHz 38kHz Tuning coil	5.1 FM signal generator 100MHz, 60dB at input 5.2 Stereo signal generator pilot signal (19kHz) 8% modulated	Antenna terminal	TP4 (See MPX BOARD)	100MHz	T301, T302	Max.
6	Separation	6.1 FM signal generator 100MHz, 60dB at input 6.2 Stereo signal generator composite signal (L) 100% modulated	Antenna terminal	TAPE OUT	100MHz	T303 VR302	1) Adjust T303 so that the Output wave form of L-side becomes max. 2) Optimize VR302 so that the Output wave form of R-side becomes min.
7	Lighting Level of STEREO Indicator Lamp	7.1 FM signal generator 100MHz, 60dB at input 7.2 Stereo signal generator pilot signal (19kHz) 4.5 ±0.5% modulated	Antenna terminal	STEREO Indicator Lamp	100MHz	VR301	Adjust VR301 so that stereo indicator lamp will light when the modulation degree of pilot signal is 4.5±0.5%.

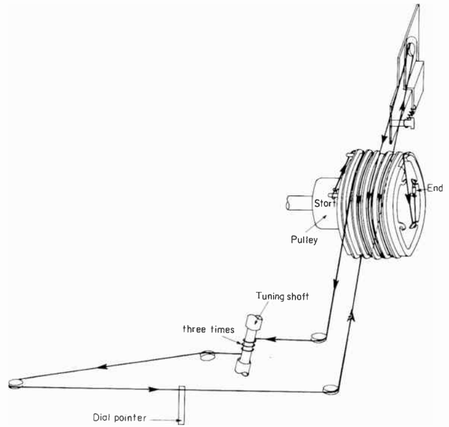
4.3 AM TUNER ALIGNMENT

Steps	Item	Measuring Instrument	Input Terminal	Output Terminal	Frequency	Adjust	Wave Form
1	IF Amplifier	455kHz±10kHz Sweep generator	AM antenna terminal	TP5 (See AM-IF -FM-IF BOARD)		(A) L111 (B) T111 (C) T205 (D) T206 (E) L111	Core Max. Gain Max. Gain Max., (Fig.4) Gain Max., (Fig.4) Gain Min.
2	Covering	2.1 AM signal generator 515kHz 400Hz 30% modulated 2.2 AM signal generator 1650kHz 400Hz 30% modulated Repeat (2.1) & (2.2)	Ferrite antenna Ferrite antenna	TAPE OUT TAPE OUT	515kHz 1650kHz	L113 TC5	Output Max. Output Max.
3	Tracking	3.1 AM signal generator 600kHz 400Hz 30% modulated 3.2 AM signal generator 1400kHz 400Hz 30% modulated Repeat (3.1) & (3.2)	Ferrite antenna Ferrite antenna	TAPE OUT TAPE OUT	600kHz 1400kHz	FERRITE ANT. TC6	Output Max. Output Max.
4	Output	AM signal generator 1000kHz 400Hz 30% modulated 74dB at input	Ferrite antenna	TAPE OUT	1000kHz	VR202	Adjust the output to gain 350mV +2dB -1dB
5	10kHz Trap	AM signal generator 1000kHz 10kHz 30% modulated 94dB at input	Ferrite antenna	TAPE OUT	1000kHz	L204	Output Min.
6	Strength Meter	AM signal generator 1000kHz 400Hz 30% modulated 74dB at input	Ferrite antenna	strength meter	1000kHz	VR203	Adjust VR203 so that pointer of meter will deviate between 4 and 4.5.

4.4 AUDIO CIRCUIT ALIGNMENT

Steps	Item	Measuring Instrument	Point to be Measured	Adjust	Value Adjusted
1	Idle Current	DC volt meter (30mV range)	connect (+) terminal of DC volt meter to TP6 connect (-) terminal of DC volt meter to TP7	VR603	Steady state: 20±2.5mV
		VR604 (TP6', TP7') : Adjust similarly			
2	VQ Voltage	DC volt meter (100V range)	connect (+) terminal of DC volt meter to TP8 connect (-) terminal of DC volt meter to chassis	VR601	32V
		VR602 (TP8', chassis) : Adjust similarly			

5. DIAL CORD SETTING



NOTE.

1. Pass the dial cord with the variable condenser closed. The figure above shows the correct condition before threading.
2. Turn the dial cord one time around the pulley, before tying the cord end to the spring.
3. How to pass the dial cord around the tuning shaft is shown in the figure above. Pass the dial cord through the hole of the tuning shaft and turn the dial cord around the shaft 3 times in the arrow direction. After that, remove it.

SEMICONDUCTORS

ITEM	PART NO.	TYPE
CR101	2337101	HZ-12(A)
CR201	0575005	1N60
CR202	0575002	1N34A
CR203	0575002	1N34A
CR204	0575005	1N60
CR205	0575005	1N60
CR206	0575005	1N60
CR207	0575002	1N34A
CR208	2337011	1S2076
CR301	0575002	1N34A
CR302	0575002	1N34A
CR303	2337011	1S2076
CR304	2337011	1S2076
CR305	2337011	1S2076
CR306	2337011	1S2076
CR601	2337071	HV-26G
CR602	2337071	HV-26G
CR603	2337071	HV-26G
CR604	2337071	HV-26G
CR605	2337071	HV-26G
CR606	2337071	HV-26G
CR611	2327074	AW01-13
CR612	2327077	AW01-16
CR613	2327031	V03C
CR614	2327031	V03C
CR615	2327031	V03C
CR616	2327031	V03C
CR617	2327075	AW01-30
FET101	2327132	3SK30A
IC201	2327312	HA1201
IC202	2327312	HA1201
IC203	2327311	HA1201
IC401	2327302	FA6001D
IC402	2327302	FA6001D
IC403	2327302	FA6301D
Q1	2327052	2SC1030(B)
Q2	2327052	2SC1030(B)
Q3	2327052	2SC1030(B)
Q4	2327052	2SC1030(B)
Q101	0573510	2SC535(B)
Q102	0573507	2SC461(B)
Q103	0573486	2SC460(B)
Q104	0573486	2SC460(B)
Q201	0573486	2SC460(B)
Q202	0573486	2SC460(B)
Q203	0573486	2SC460(B)
Q204	2320063	2SC458(C)
Q205	2320063	2SC458(C)
Q206	2320063	2SC458(C)
Q207	2320063	2SC458(C)
Q301	2320073	2SC458LG(C)
Q302	2320063	2SC458(C)
Q303	2320063	2SC458(C)
Q304	2320063	2SC458(C)
Q305	2320063	2SC458(C)
Q306	2327332	2SC1213(B)
Q307	2320073	2SC458LG(C)
Q308	2320073	2SC458LG(C)
Q501	2327122	2SC458ALG(C)
Q502	2327122	2SC458ALG(C)
Q503	2327122	2SC458ALG(C)
Q504	2327122	2SC458ALG(C)
Q601	2327283	2SA673A(C)
Q602	2327283	2SA673A(C)
Q603	2320233	2SC708A(C)
Q604	2320233	2SC708A(C)
Q605	2320233	2SC708A(C)
Q606	2320233	2SC708A(C)
Q607	2320243	2SA537A(C)
Q608	2320243	2SA537A(C)
Q611	2327293	2SC1213A(C)
Q612	2327153	2SC1061(C)

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C1	0259757	2000mfd 50V
C2	0259757	2000mfd 50V
C3	0259799	2200mfd 80V
C5	0252532	220mfd 16V
C7	0252531	100mfd 16V
C140	0252525	47mfd 16V
C204	0252525	47mfd 16V
C237	0252225	47mfd 6.3V
C240	0252613	3.3mfd 25V
C243	0252811	1mfd 50V
C249	0252225	47mfd 6.3V
C301	0252613	3.3mfd 25V
C302	0252613	3.3mfd 25V
C309	0252613	3.3mfd 25V
C310	0252613	3.3mfd 25V
C311	0252613	3.3mfd 25V
C313	0252613	3.3mfd 25V
C316	0252613	3.3mfd 25V
C320	0252811	1mfd 50V
C323	0252525	47mfd 16V
C327	0252525	47mfd 16V
C333	0252531	100mfd 16V
C401	0252811	1mfd 50V
C402	0252811	1mfd 50V
C403	0252525	47mfd 16V
C404	0252525	47mfd 16V
C409	0252522	22mfd 16V
C410	0252522	22mfd 16V
C417	0252831	100mfd 50V
C418	0252613	3.3mfd 25V
C419	0252331	100mfd 10V
C420	0252861	1mfd 50V
C503	0252821	10mfd 50V
C504	0252821	10mfd 50V
C511	0252815	4.7mfd 50V
C512	0252815	4.7mfd 50V
C513	0252811	1mfd 50V
C514	0252811	1mfd 50V
C517	0252832	220mfd 50V
C518	0252813	3.3mfd 50V
C525	0252832	220mfd 50V
C601	0252813	3.3mfd 50V
C602	0252813	3.3mfd 50V
C603	0252825	47mfd 50V
C604	0252825	47mfd 50V
C605	0252831	100mfd 50V
C606	0252831	100mfd 50V
C607	0252831	100mfd 50V
C608	0252831	100mfd 50V
C621	0252825	47mfd 50V
C622	0252633	330mfd 25V
C623	0252831	100mfd 50V
C624	0252632	220mfd 25V
TC3	0283114	Trimmer
TC4	0283118	Trimmer

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R627	0119237	.47 ohms 10%
R628	0119237	.47 ohms 10%
R629	0119237	.47 ohms 10%
R630	0991237	.47 ohms 10%
TH601	0576042	Thermistor, 15D26G
TH602	0576042	Thermistor, 15D26G
VR201	0151253	47K FM Output
VR202	0151253	47K AM Output
VR203	0151252	10K AM Meter
VR204	0151253	47K FM Meter
VR205	0151254	100K Muting Level
VR301	0151254	100K FM Stereo Level
VR302	0151251	22K FM Stereo Separation
VR501	0156128	200K Dual Bass
VR502	0156128	200K Dual Treble
VR503	0156564	100K Dual Balance
VR504	0153710	100K Dual Volume
VR601	0151226	100K Amp Center Voltage
VR602	0151226	100K Amp Center Voltage
VR603	0151223	200 ohms Amp Idle Current
VR604	0151223	200 ohms Amp Idle Current

COILS/TRANSFORMERS

ITEM	PART NO.				
L1	2227035	L202	2227035	T111	2154101
L2	2227035	L204	5120145	T201	2140233
L101	2134323	L205	2227035	T202	2140238
L102	2134041	L301	5120145	T203	2140238
L103	2134324	L302	5120145	T204	2140242
L111	2140441	L303	0324005	T205	2154102
L113	2134201	T101	2134067	T206	2154103
L201	2227035	T102	2140233	Power	2217451

MISCELLANEOUS

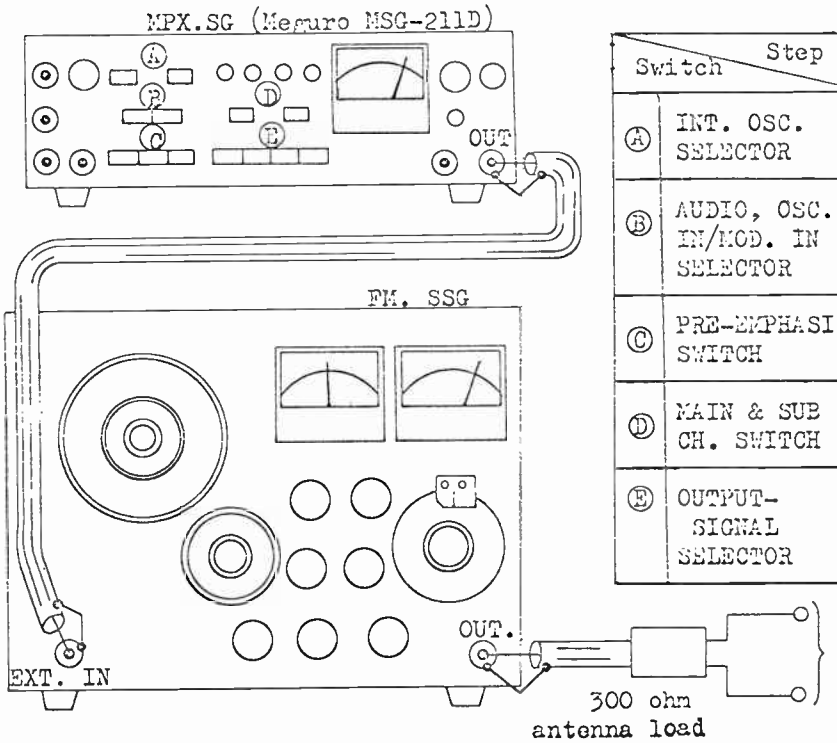
ITEM	NAME	PART NO.
CP301	Component Combination	0186007
CP302	Component Combination	0186007
F1	Fuse, 2A Slow	2727011
F2	Fuse, 3A Slow	2727085
F3	Fuse, 3A Slow	2727085
F4	Fuse, 2.5A Slow	0591208
F5	Fuse, 2.5A Slow	0591208
SW1	Switch, Function	2617063
SW2	Switch, Tape	2637201
SW3	Switch, Mode	2637201
SW4	Switch, Muting	2637201
SW5	Switch, High Filter	2637201
SW6	Switch, Loudness	2637201
SW7	Switch, Speaker	2617133
	Meter, Center	2577101
	Meter, Signal	2577102
	P.C. Board, FM RF	2518701
	P.C. Board, AM RF	2517933
	P.C. Board, IF	2518803
	P.C. Board, MPX	2517944
	P.C. Board, Equalizer	2518861
	P.C. Board, Tone	3915282
	P.C. Board, Power/Main Amp	2519021
	P.C. Board, Lamp	2518571
	P.C. Board, DIN	2518332

CABINET PARTS

NAME	PART NO.
Assembly, Escutcheon	3241541
Knob, Tuning	3281021
Knob, Inner Control	3281001
Knob, Outer Control	3281011
Cover	4358774
Board, Bottom	4358753
Board, Left Side	4926221
Board, Right Side	4926222

Pages 61-72 Courtesy of MORSE ELECTRO PRODUCTS CORP.

Fig. R-1



Setting of Switches (Ⓐ ~ Ⓔ)

Switch \ Step	2.	3.	4.
Ⓐ INT. OSC. SELECTOR	400Hz	"	"
Ⓑ AUDIO, OSC. IN/MOD. IN SELECTOR	AUDIO OSC.	"	"
Ⓒ PRE-EMPHASIS SWITCH	75 μ sec.	"	"
Ⓓ MAIN & SUB CH. SWITCH	MAIN & PILOT	PILOT ONLY	MAIN & PILOT
Ⓔ OUTPUT-SIGNAL SELECTOR	MAIN	"	CHANGE L ↔ R

-AM/FM TUNER SECTION-

Needed Equipment:

1. VTVM
2. AM/FM SSG (Standard Signal Generator)
3. AM/FM IF GS (Gene-scope)
4. FM MPX SSG (Stereo Signal Generator)
5. Audio SG (Audio Frequency Signal Generator)
6. Oscilloscope
7. Non-metallic Alignment Tool
8. Dummy load = 8 ohm, 10W Resistor

Procedure & Notes:

1. Set Balance, Bass, and Treble controls to their Center.
2. Set Volume Control to Maximum.
3. Keep signal input level as low as possible.
4. Standard modulation is 30% (or 22.5 KHz dev.) - 400Hz.
5. FM antenna input load is 300 ohms balanced.
6. Refer to P.C. Board TUP-007 for parts location.
7. Low sides of signal sources & output indicators are connected to Earth-line nearest point of high-side's connections, unless otherwise noted.
8. Set selector to each position being adjusted.

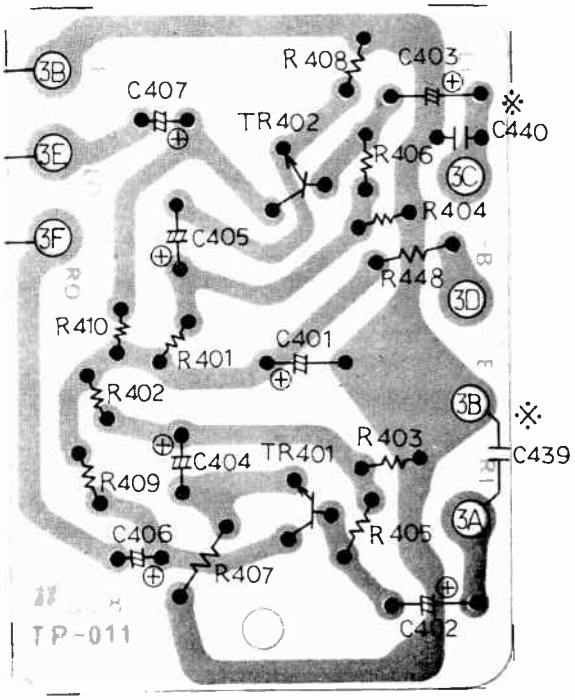
Notes: 1. * Output = standard-modulated signal.

2. (*) marked = adjusted with Alignment-Tool.

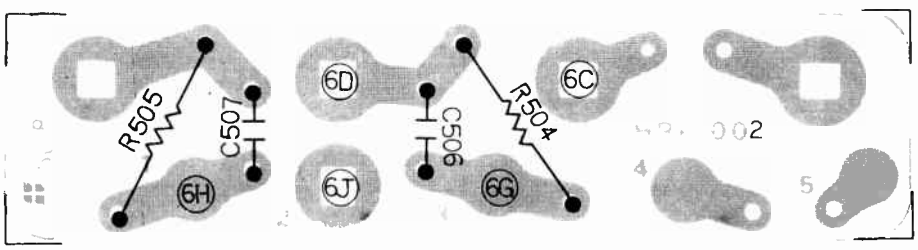
3. (**) marked = adjusted by compressing, or expanding.

Article		Step	Signal-Source Connect	Set Signal To	Output Indicator connect to	Set Radio Dial To..	Adjust	Adjust For ..
IFT Adj.	455 kHz	1.	Selector is set to "AM" position.					
		2.	IF GS * Output to Standard Loop Antenna	Sweep centered 455 kHz	IF GS Input to (1R)	Minimum Freq.	* T107 (yellow)	Maximum
		3.	"	"	"	"	* T108 (white)	"
		4.	"	"	"	"	* T109 (black)	"
		5.	Repeat Step 2 - 4, a few times.					
	10.7 MHz	1.	Disconnect lead-wire of C139 (1 uF 10V). Selector is set to "FM" position.					
		2.	IF GS * Output to TM1 & TM2	Sweep @ ± 1MHz centered 10.7MHz	IF GS Input to lead-wire of C139	Maximum Freq.	* T101 (orange)	Maximum symmetrical "V" curve.
		3.	"	"	"	"	* T102 (black)	"
		4.	"	"	"	"	* T103 (black)	"
		5.	"	"	"	"	* T104 (blue)	"
		6.	Repeat Step 2 - 5, a few times, and connect lead of C139.					
		7.	"	"	IF GS Input to 1P	"	* T105 (brown)	Symmetrical "S" curve.
Band-width Adj.	AM	1.	SSG (AM) * Output to Standard Loop Antenna	525 kHz	VTVM & Oscillo(paralleled dummy load) Input to Speaker Jack (J9 or J10)	Minimum Freq. (close VC)	* T106 (red)	Maximum

Article		Step	Signal-Source Connect	Set Signal To	Output Indicator Connect to	Set Radio Dial to..	Adjust	Adjust For ..
Band-width Adj.	AM	2.	SSG (AM) * Output to Standard Loop Antenna	1650 kHz in summer 1660 kHz in autumn or spring 1670 kHz in winter	VTVM & Os-cillo(par-alleled dummy load) Input to Speaker Jack (J9 or J10)	Maximum Freq. (open VC)	* VC4	Maximum
		3.	Repeat Step 1 - 2, a few times.					
	FM	1.	SSG (FM) * Output to TM1 & TM2	86 MHz	"	Minimum Freq. (close VC)	** L104	"
		2.	"	109.5MHz	"	Maximum Freq. (open VC)	* TC101	"
		3.	Repeat Step 1 - 2, a few times.					
Trac-king Adj.	AM	1.	SSG (AM) * Output to Standard Loop Antenna	600 kHz	"	Tune on signal	L105 (bar-antenna)	"
		2.	"	1400 kHz	"	"	* VC3	"
		3.	Repeat Step 1 - 2, a few times.					
	FM	1.	SSG (FM) * Output to TM1 & TM2	90 MHz	"	"	**L102	"
		2.	"	98 MHz	"	"	* L101	"
		3.	"	106 MHz	"	"	* VC1	"
		4.	Repeat Step 1 - 3, a few times.					
FM MPX Adj.		1.	Audio SG Output to (- pole) of C201 (1uF 10V)	67 kHz	VTVM & Os-cillo. Input to B (base) of TR201	@ 98 MHz	* L201	Minimum
		2.	FM SSG & FM MPX SSG (See Fig. R-1)	98 MHz (See Fig. R-1)	VTVM & Os-cillo. Input to C(collector) of TR202	Tune on signal	* T201 * T202	Maximum (38 kHz = carrier)
		3.	"	"	VTVM & Os-cillo. Input to (1N) or (10)	"	* L202	Minimum (19 kHz = pilot-leak)
		4.	"	"	"	"	*VR201	Minimum (400 Hz = leak of the other Ch.)



AUDIO PREAMP (TP-011)



TAPE INPUT (HRP-002)

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D1	0112-0028	1N60
D2	0113-0027	SC-15
D3	0112-0028	1N60
D4	0112-0028	1N60
D105	0114-0017	1S334
D107	0112-0028	1N60
D108	0112-0028	1N60
D109	0112-0073	1N60(P)
D110	0112-0073	1N60(P)
D201	0112-0073	1N60(P)
D202	0112-0073	1N60(P)
D203	0112-0046	1S34S
D204	0112-0046	1S34S
D205	0112-0046	1S34S
D206	0112-0046	1S34S
D207	0112-0037	1S34
D208	0112-0037	1S34
D401	0131-0026	VD1210
D402	0131-0026	VD1210
D501	0110-0011	10DC-1R
TR101	0103-0389	2SC1047
	0103-0191	2SC784
TR102	0103-0060B	2SC829B
TR103	0103-0060B	2SC829B
TR104	0103-0060B	2SC829B
TR105	0103-0060A	2SC829A
TR106	0101-0034	2SA102BA
TR201	0103-0014(R-T)	2SC828(R-T)
TR202	0103-0014(R-T)	2SC828(R-T)
TR203	0103-0014(S-U)	2SC828(S-U)
TR401	0103-0088	2SC644
TR402	0103-0088	2SC644
TR403	0103-0014	2SC828
TR404	0103-0014	2SC828
TR405	0103-0051	2SC538
TR406	0103-0051	2SC538
TR407	0103-0419	2SC1226
TR408	0103-0419	2SC1226
TR409	0101-0448	2SA699
TR410	0101-0448	2SA699

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE
C115	0904-0416	1mfd 16V
C121	0902-1011	10mfd 10V
C124	0902-1519	470mfd 10V
C139	0904-0416	1mfd 16V
C201	0902-0418	1mfd 10V
C205	0902-1011	10mfd 10V
C208	0902-1011	10mfd 10V
C215	0902-0418	1mfd 10V
C401	0902-1415	220mfd 10V
C402	0942-0516	.47mfd 10V
C403	0942-0516	.47mfd 10V
C404	0900-1116	33mfd 6V
C405	0900-1116	33mfd 6V
C406	0902-0418	1mfd 10V
C407	0902-0418	1mfd 10V
C410	0904-1413	220mfd 16V
C419	0904-0811	4.7mfd 16V
C420	0904-0811	4.7mfd 16V
C421	0902-1415	220mfd 10V
C422	0902-1415	220mfd 10V
C423	0902-1011	10mfd 10V
C424	0902-1011	10mfd 10V
C425	0902-1519	470mfd 10V
C426	0902-1519	470mfd 10V
C429	0902-1519	470mfd 10V
C430	0902-1519	470mfd 10V
C441	0909-1710	2200mfd 35V
TC101	0441-0012	Trimmer
VC	0431-0019	Tuning Gang

CONTROLS

ITEM	PART NO.	DESCRIPTION
VR201	0540-0132	1000 ohms Separation
VR401	0551-0031	50K Balance
VR402	0565-0069	50K Volume
VR403	0565-0031	50K Treble
VR404	0565-0031	50K Bass

COILS/TRANSFORMERS

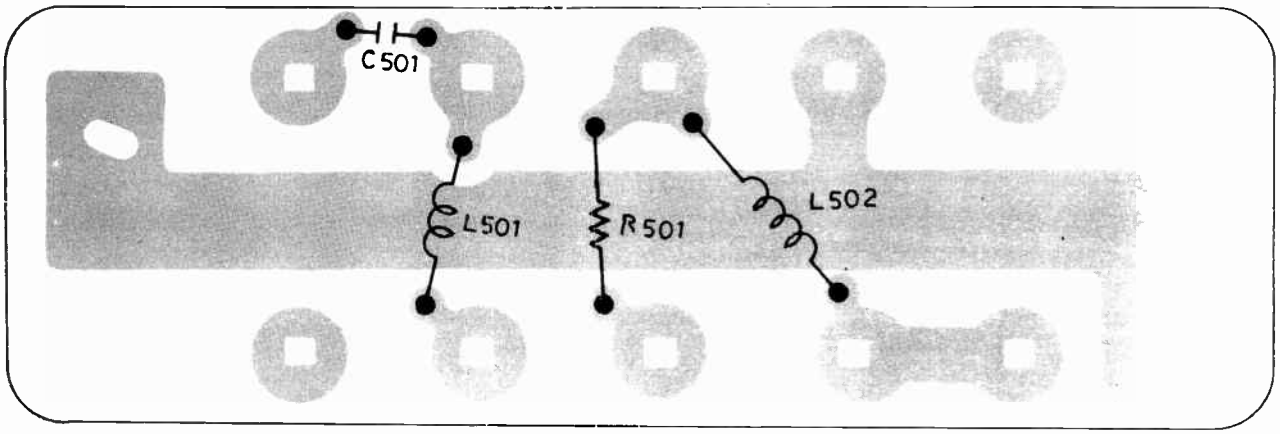
ITEM	PART NO.
L101	0320-0019
L102	0331-0049
L103	0333-0010
L104	0332-0057
L105	0310-0438
L201	0356-0014
L202	0356-0041
L501	0340-0025
L502	0340-0025
T101	0352-0018
T102	0352-0027
T103	0352-0027
T104	0355-0015
T105	0355-0024
T106	0303-0140
T107	0350-0010
T108	0350-0038
T109	0350-0029
T201	0356-0127
T202	0356-0127
T501	0201-0379

MISCELLANEOUS

ITEM	NAME	PART NO.
SW1	Switch, AFC	EST-121K
SW2	Switch, Loudness	EST-121K
SW3	Switch, Push Button	ESB-565L
SW501	Switch, Power	EST-1030KU
PR1	P.C. Board, Main Amp	0701-1411 (TUP-007)
PR2	P.C. Board, Audio Preamp	0701-0912 (TP-011)
PR3	P.C. Board, Controls	0701-0921 (TP-013)
PR4	P.C. Board, Switch	0701-1515 (SW-6)
PR5	P.C. Board, Power Choke	0701-1421 (ACP-005)
PR6	P.C. Board, Tape Input	0701-0819 (HRP-002)

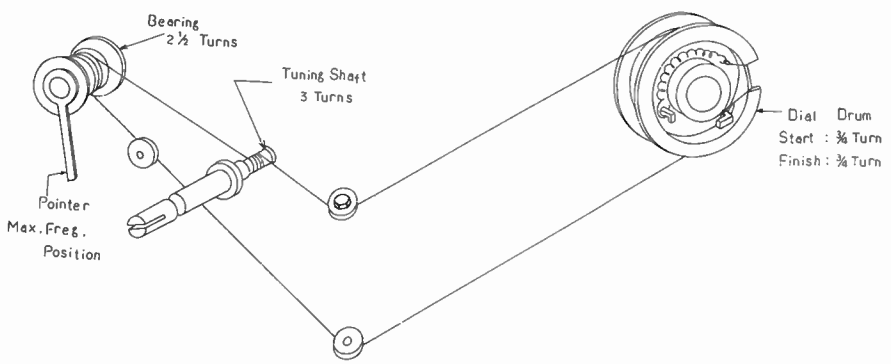
CABINET PARTS

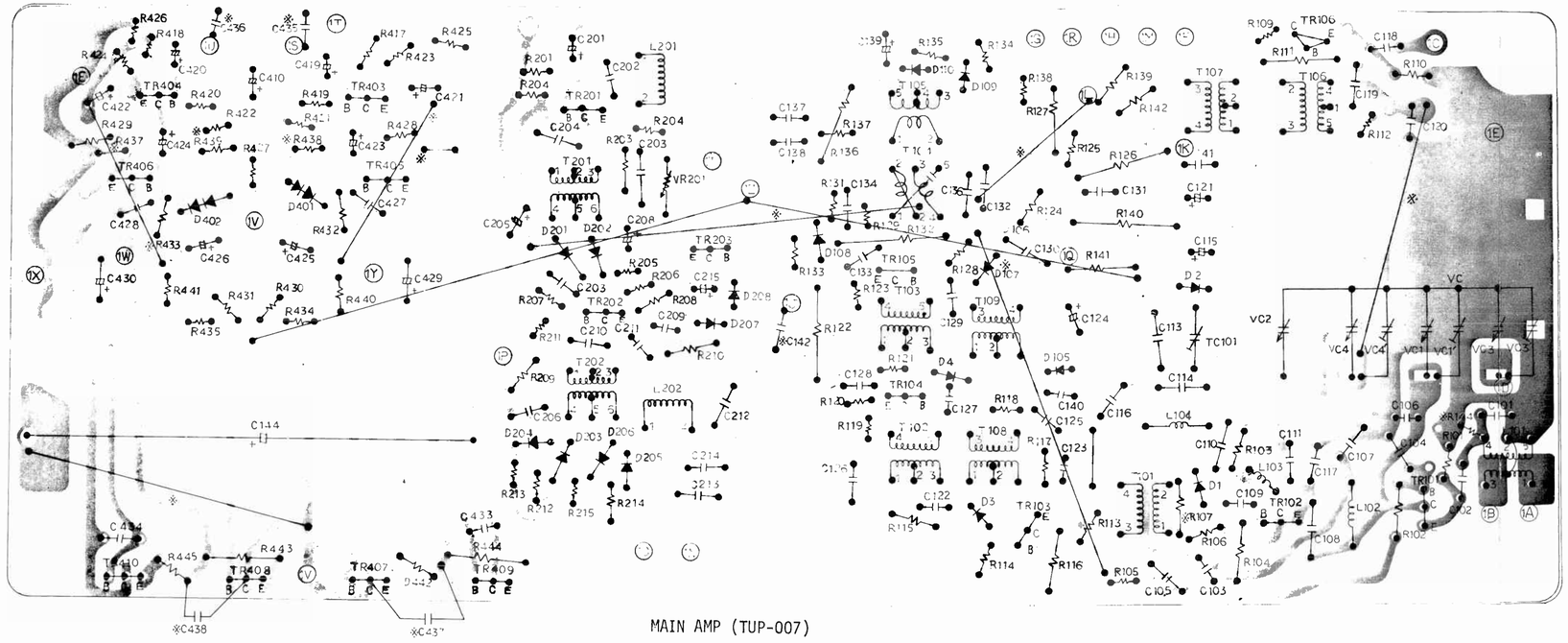
NAME	PART NO.
Cabinet	D-275
Cabinet, Rear Cover	E-110
Front Panel	D-277A
Dial Pointer	A-2334
Push Button (5 Used)	A-2290
Knob, Tuning	A-1692A
Knob, Balance	A-2294
Knob, Volume	A-2294
Knob, Treble	A-2294
Knob, Bass	A-2294



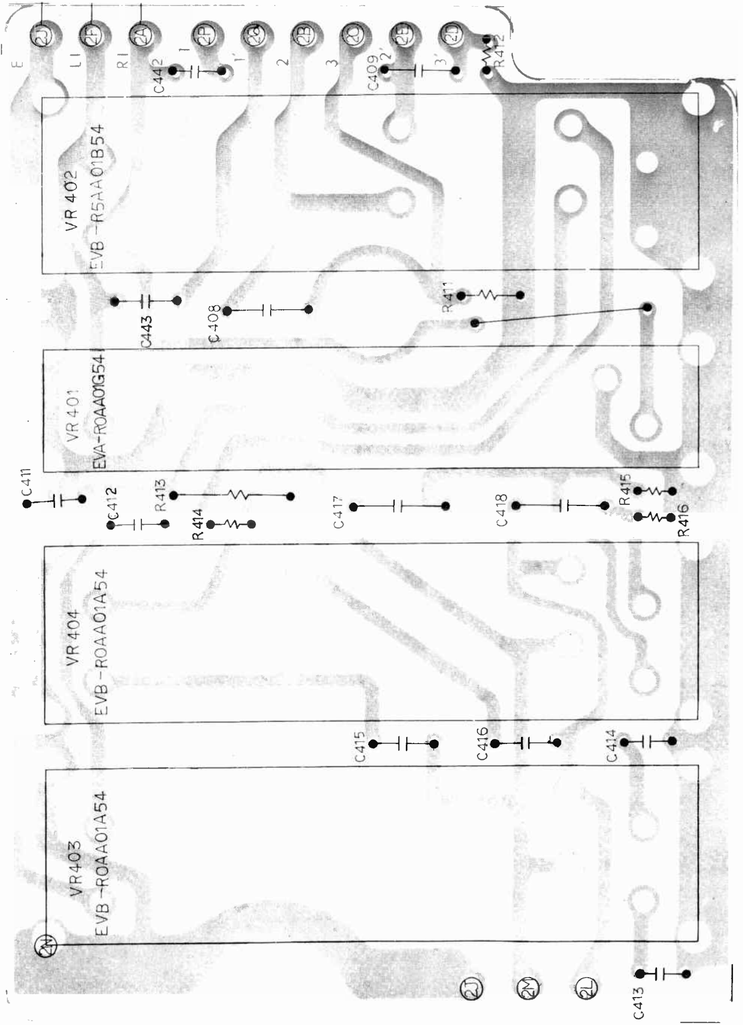
LINE CHOKE (ACP-005)

ALIGNMENT VIEW OF DIAL CORD

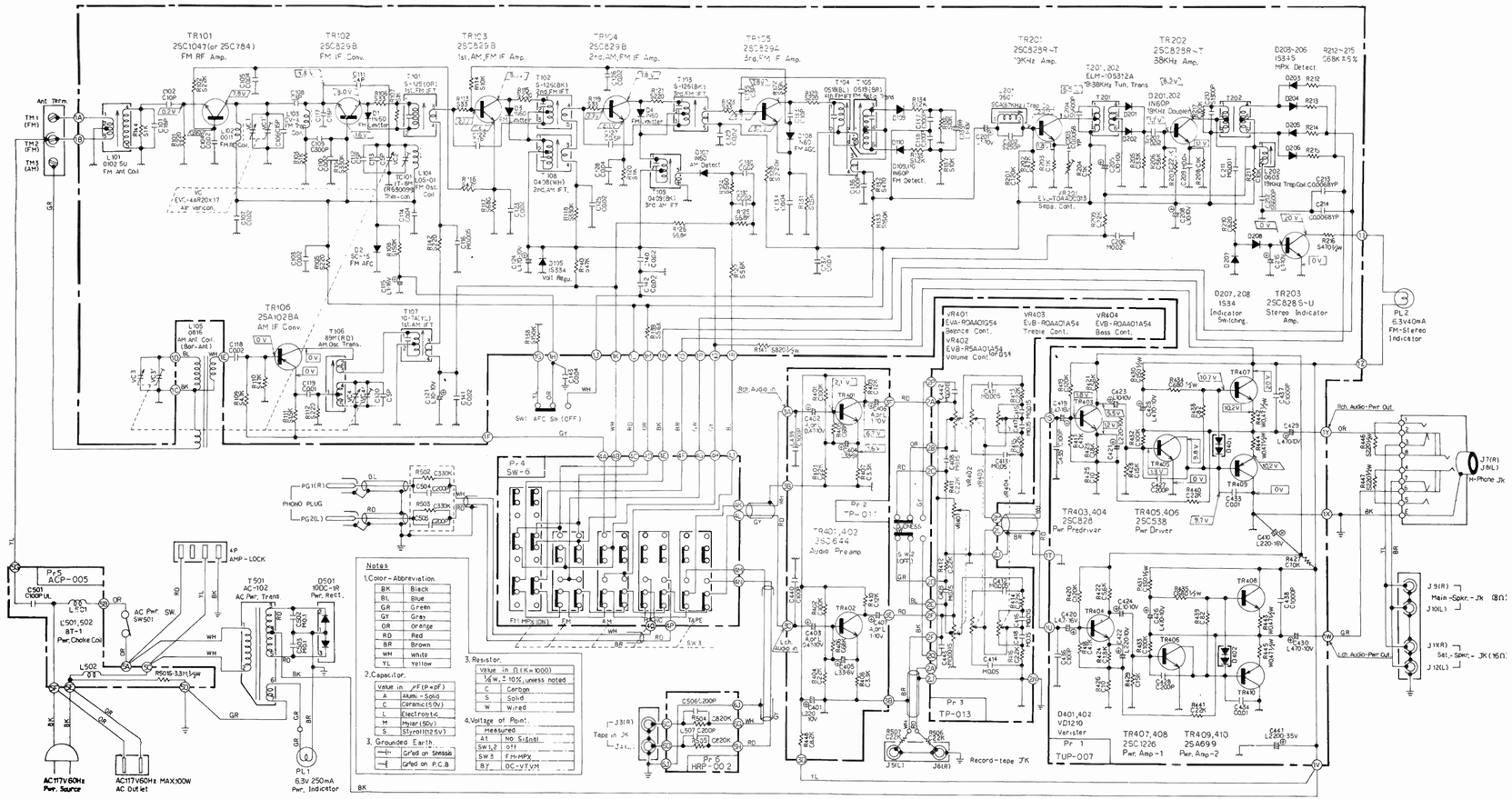




MAIN AMP (TUP-007)



CONTROLS (TP-013)



Olympic CS843, CS844, CS845, CST850 (Ch.330-1)

Pages 73-80 Courtesy of OLYMPIC INT'L. LTD.

EQUIPMENT REQUIRED

TV/FM Sweep Generator ..... 10.7 MHz
Audio Generator ..... 67 KHz
Oscilloscope .....
Signal Generator ..... 455 KHz – 109 MHz
AM-FM MOD MAX 100%
Loop or several turns of wire in Loop form connected to signal generator output connection.
AC output meter ..... VTVM or Rectifier type AC-DC Multitester
Multiplex Generator .....
Alignment Screwdrivers ..... FLAT Metal and Insulated

CONTROL SETTINGS

Volume Control ..... MAX. Clockwise
Treble Control ..... MAX. Counter-Clockwise
Bass Control ..... MAX. Counter-Clockwise
Balance Control ..... Mechanical Center

GENERAL ALIGNMENT CONDITIONS

1. Connect low side of signal source and output indicator to chassis ground as close as possible to high side connection unless otherwise specified.

2. Signal input should be kept as low as possible to avoid AVC action. (Set output indicator to highest sensitivity.)

3. Markers should be accurate. (Crystal controlled or checked against a crystal calibrator.) The 10.7 MHz marker used in each section of the alignment should be the same. (Generator dial should not be moved.)

4. Marker insertion and amplitude should not distort the oscilloscope trace.

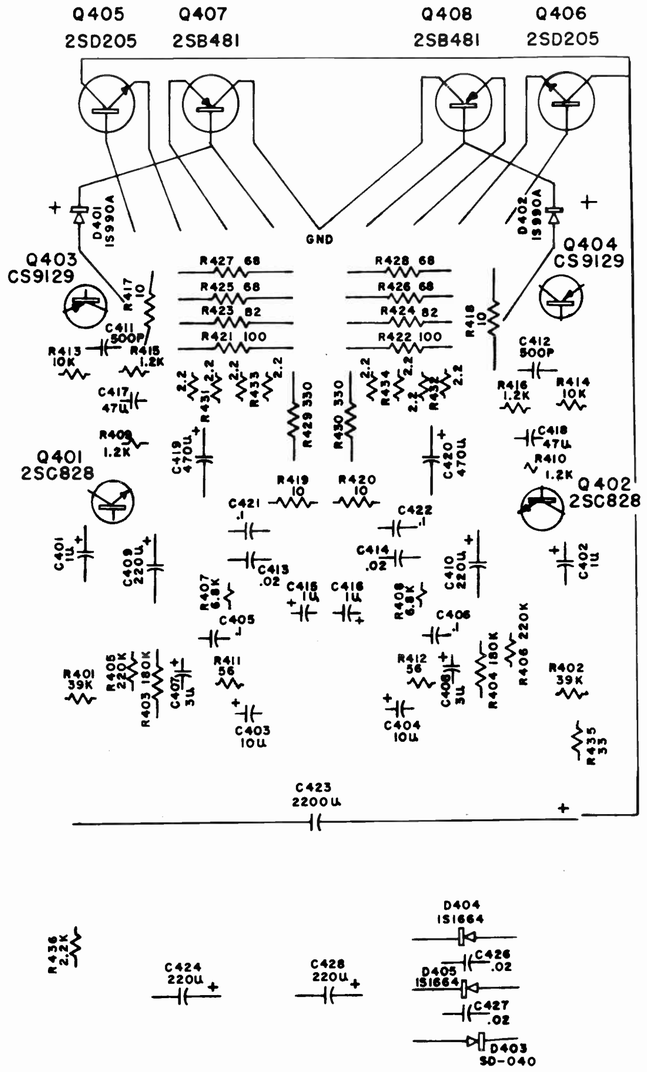
AM-FM ALIGNMENT PROCEDURE

<table>
<tr><th>Step</th><th>Signal Source Connected To</th><th>Set Signal To</th><th>Set Radio Dial To</th><th>Output Indicator Connected To</th><th>Adjust</th><th>Adjust For</th></tr>
<tr><td>1</td><td colspan="6">Set Function Switch to AM</td></tr>
<tr><td>2</td><td rowspan="9">RF Generator
A standard radiating loop or a short piece of wire placed near AM antenna</td><td rowspan="3">455 kHz (modulated)</td><td rowspan="3">Gang Closed</td><td rowspan="3">AC meter across each speaker</td><td>T201 (1st AM IF)</td><td rowspan="8">Maximum</td></tr>
<tr><td>3</td><td>T203 (2nd AM IF)</td></tr>
<tr><td>4</td><td>T205 (3rd AM IF)</td></tr>
<tr><td>5</td><td colspan="4">Repeat steps 2 through 4 to obtain maximum sensitivity.</td></tr>
<tr><td>6</td><td>525 kHz (modulated)</td><td>Gang Closed</td><td rowspan="4">AC meter across each speaker</td><td>L201 (AM OSC coil)</td></tr>
<tr><td>7</td><td>1700 kHz (modulated)</td><td>Gang Open</td><td>TC503 (AM OSC trim)</td></tr>
<tr><td>8</td><td>600 kHz (modulated)</td><td>600 kHz</td><td>L501 (AM Ant. coil)</td></tr>
<tr><td>9</td><td>1400 kHz (modulated)</td><td>1400 kHz</td><td>TC501 (AM Ant. trim)</td></tr>
<tr><td>10</td><td colspan="6">Repeat steps 6 through 9 to obtain best tracking</td></tr>
</table>

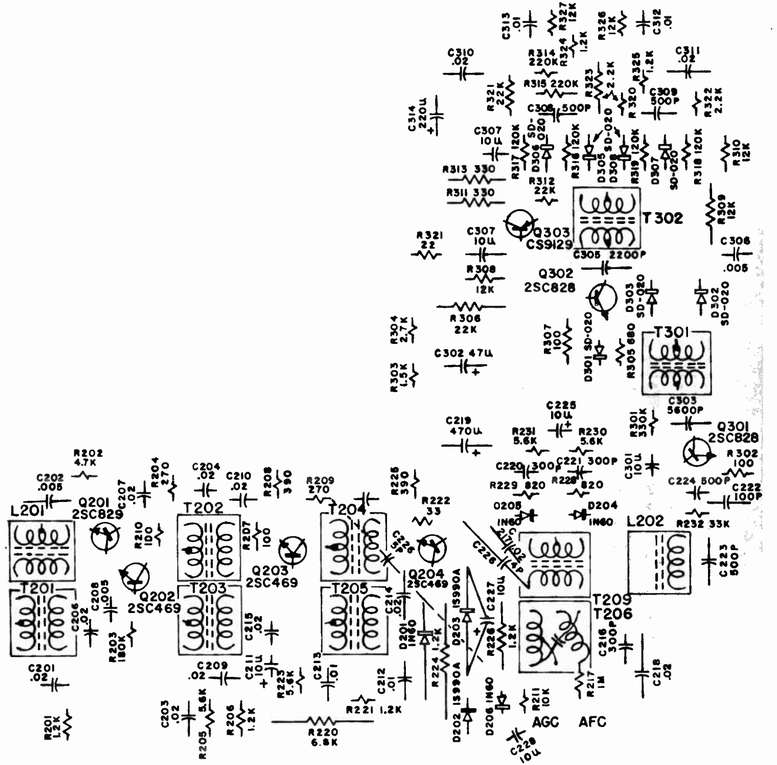
11	Set Function Switch to FM					
12	Sweep Generator Q102 emitter thru a 0.05 μF capacitor	Center at 10.7 MHz Sweep width: ± 0.5 MHz Marker ± 150 kHz	Gang Open	Oscilloscope Junction of C216, R217, and L202 thru a 0.1 μF capacitor	T101 (1st FM IF)	Max. amplitude & balanced curve
13					T202 (2nd FM IF)	
14					T204 (3rd FM IF)	
15					T206 Pri (FM Rat. Det.)	
16					T207 Sec (FM Rat. Det.)	
17	Repeat steps 12 through 16 to obtain a maximum amplitude balanced curve					
18	FM Generator FM antenna terminals	86.5 MHz (modulated)	Gang Closed	AC meter across each speaker	L104 (FM OSC coil)	Maximum
19		109.5 MHz (modulated)	Gang Open		TC504 (FM OSC trim)	
20		90 MHz (modulated)	90 MHz		L102 (FM RF coil)	
21		106 MHz (modulated)	106 MHz		TC502 (FM RF trim)	
22	Repeat steps 18 through 21 to obtain maximum sensitivity.					

MULTIPLEX ALIGNMENT (Set Function Switch to FM Stereo)

Step	Signal Source Connected To	Set Signal To	Set Radio Dial To	Output Indicator Connected To	Adjust	Adjust For
1	Audio Generator Junction of C216, R217, and L202	67 kHz	98 MHz	AC Meter Junction of R232, C224, and C222	L202 67 kHz coil	Minimum
2	Multiplex Generator FM antenna	98 MHz		AC Meter Q302 Collector	T301 19 kHz coil	Generator composite MPX mod. (75 kHz deviation at 1000 Hz mod.) maximum
3				AC Meter across each speaker	T302 38 kHz coil	Maximum separation



AUDIO AMPLIFIER PRINTED CIRCUIT BOARD COMPONENT LAYOUT



IF-MPX PRINTED CIRCUIT BOARD COMPONENT LAYOUT

SEMICONDUCTORS

ITEM	PART NO.	TYPE
D102	DIJ70485	1S2139B
D202	DIJ70486	1S990
D203	DIJ70486	1S990
D401	DIJ70486	1S990
D402	DIJ70486	1S990
D403	RFJ70487	SD040
D404	DIJ70488	FR2-02/1S1664
D405	DIJ70488	FR2-02/1S1664
Q101	TNJ70478	2SC829-A (2SC839)
Q102	TNJ70478-1	2SC829-B (2SC839)
Q201	TNJ70478	2SC829-A (2SC839)
Q202	TNJ70479	2SC469-R (2SC838)
Q203	TNJ70479-1	2SC469-Q (2SC838)
Q204	TNJ70479-1	2SC469-Q (2SC838)
Q301	TNJ70480	2SC828-R (2SC945-R)
Q302	TNJ70484	2SC828-O (2SC945-O)
Q303	TNJ70481	CS9129
Q401	TNJ70480	2SC828-R (2SC945-R)
Q402	TNJ70480	2SC828-R (2SC945-R)
Q403	TNJ70481	CS9129 (2SA643)
Q404	TNJ70481	CS9129 (2SA643)
Q405	TNJ70482	2SD205
Q406	TNJ70482	2SD205
Q407	TNJ70483	2SB481
Q408	INJ61224	1N60

VARIABLE CAPS

ITEM	PART NO.	DESCRIPTION
TC501 TC502 TC503	CVJ70507	Tuning Gang
TC504	CVJ70508	Trimmer

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R509	REJ70517	8 ohm 10% 2W
R510	REJ70517	8 ohm 10% 2W
R519	PTJ70515	1meg Balance
R520	PTJ70514	500K Dual Volume
R521	PTJ70512	50K Dual Bass
R522	PTJ70513	10K Dual Treble

COILS/TRANSFORMERS

ITEM	PART NO.		
L101	CLJ70489	T202	TRJ70496
L102	CLJ70490	T203	TRJ70501
L103	CLJ70491	T204	TRJ70497
L104	CLJ70492	T205	TRJ70502
L201	CLJ70494	T206	TRJ70498
L202	CLJ70506	T209	TRJ70499
L501	CLJ70493	T301	TRJ70504
T101	TRJ70495	T302	TRJ70505
T201	TRJ70500	T501	TRJ70503

MISCELLANEOUS

ITEM	NAME	PART NO.
(COMMON)		
S501	Switch, Function	SWJ70509
S502	Switch, Power	SWJ70510
S503	Switch, AFC	SWJ70511

(MODEL CS843)

Speaker, 4"	SK36416
Speaker, 6-1/2"	SK36419
Assembly, Record Changer (BSR C116)	RX36453
Cartridge, Phono (VARCO TN4B)	PXD70015
Stylus, Phono (VARCO TN4)	NED70016

(MODEL CS844)

Speaker, 6-1/2"	SK36419
Assembly, Record Changer (Garrard 5300)	RX36457
Cartridge, Phono (VARCO TN4B)	PXD70015
Stylus, Phono (VARCO TN4)	NED70016

(MODEL CS845)

Speaker, 4"	SK36416
Speaker, 8"	SK36420
Assembly, Record Changer (BSR C117)	RX36455
Cartridge Phono (VARCO TN4B)	PXD70015
Stylus, Phono (VARCO TN4)	NED70016

(MODEL CST850)

Speaker, 4"	SK36416
Speaker, 6-1/2"	SK36419
Assembly, Record Changer (Garrard 5300)	RX36457
Cartridge, Phono (VARCO TN4B)	PXD70015
Stulys, Phono (VARCO TN4)	NED70016
Assembly, Tape Deck	TDA301

CABINET PARTS

NAME	PART NO.
(COMMON)	
Cover, Dust	DC36551
Escutcheon, Radio	ES36465-1
Knob, Selector/Balance/Bass/ Treble/Loudness	KN36404
Knob, Tuning	KN36405

(MODEL CS843)

Board, Bottom	ST36411
Cabinet	CA36388
Enclosure, Speaker	SE36443

(MODEL CS844)

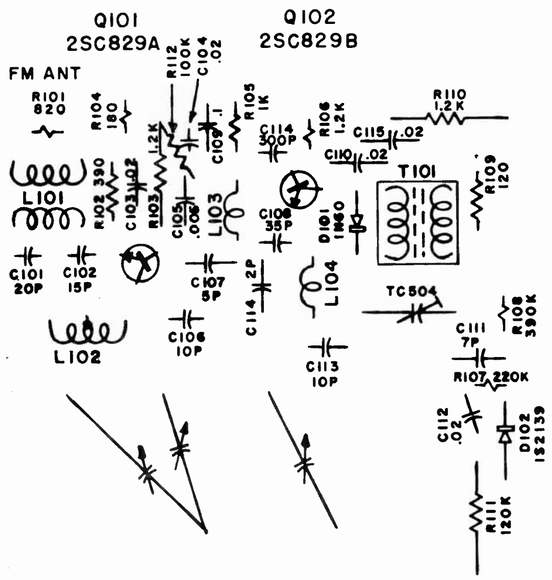
Board, Bottom	ST36411
Cabinet	CA36388
Enclosure, Speaker	SE36444-1

(MODEL CS845)

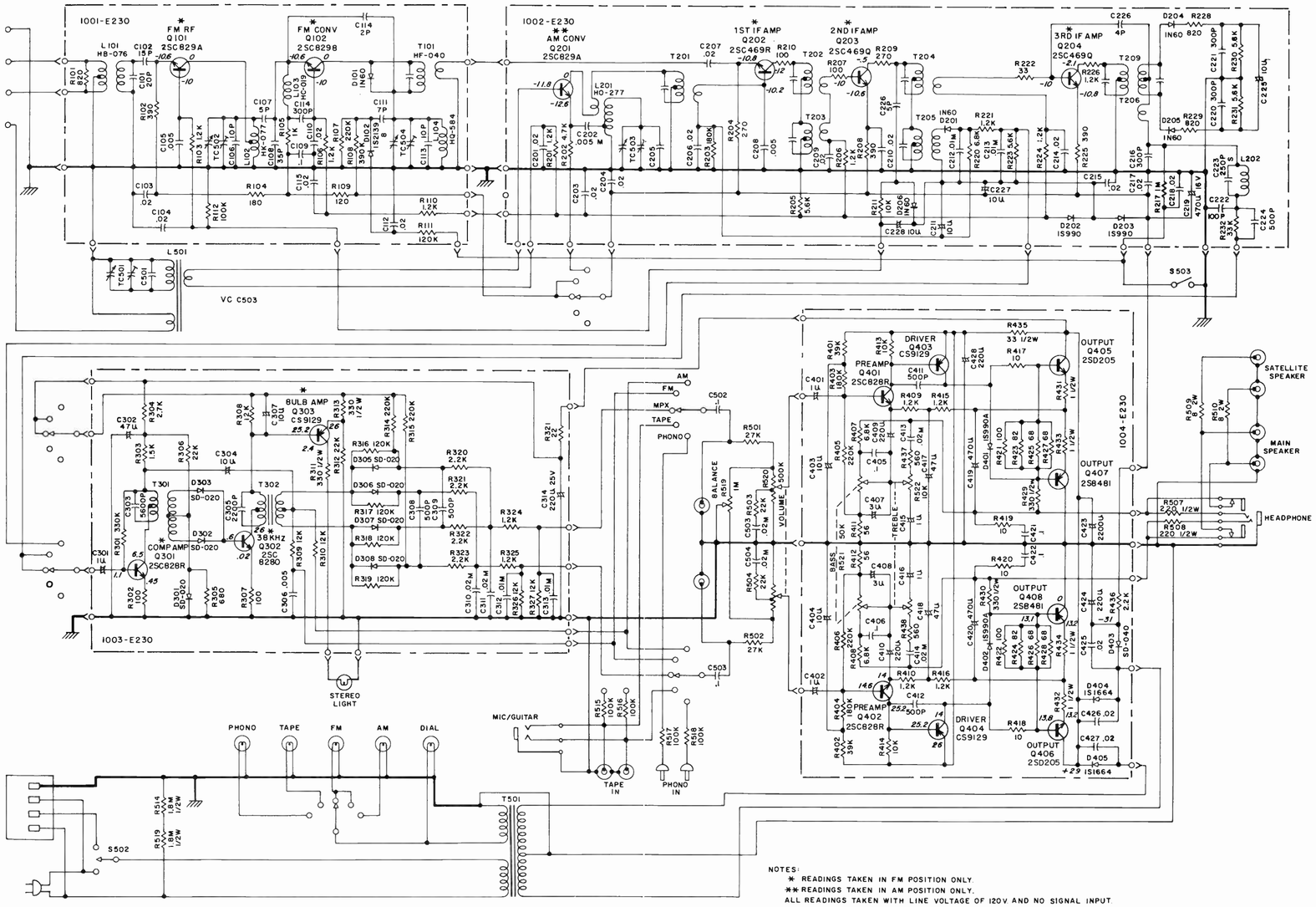
Board, Bottom	ST36411
Cabinet	CA36388

(MODEL CST850)

Board, Bottom	ST36412
Cabinet	CA36461
Enclosure, Speaker	SE36446



RF PRINTED CIRCUIT BOARD COMPONENT LAYOUT



Pages 81-92 Courtesy of MATSUSHITA ELEC. CORP. OF AMERICA

ALIGNMENT INSTRUCTIONS-READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Notes :

1. Volume control — Minimum
2. Speakers switch — OFF
3. Other controls — Optional position
4. Maintain line voltage at 120 volts.
5. DC VTVM — 30 mV full scale

	CIRCUIT	VTVM CONNECTION	ADJUSTMENT	REMARKS
	MAIN AMP ALIGNMENT			
1	DC UNBALANCE	Connect to No. 708⊕, 707⊖ (left) and No. 705⊕, 707⊖ (right) terminals.	VR_{701} (Left) VR_{702} (Right)	Make sure that VTVM become 0.
2	Icq	Connect to No. 711⊕, 709⊖ (left) and No. 702⊕, 704⊖ (right) terminals.	VR_{703} (Left) VR_{704} (Right)	Make adjustments so that the indication on VTVM becomes 3.7 mV

Notes :

1. Volume control — Maximum (AM·RF)
   Minimum (AM·IF, FM·IF)
   Variable (FM·RF)
2. Bass and treble control — Center
3. Band selector switch — AM, FM·Mono (FM·IF)
   FM·Auto (FM·RF)
4. Loudness switch — OFF
5. Muting switch — OFF
6. High, low filter switch — OFF
7. Tape·monitor switch — Source
8. Mode switch — Stereo
9. Speakers switch — Main
10. Maintain line voltage at 120 volts.
11. Output of signal generator should be no highter than necessary to obtain an output reading.

	SIGNAL GENERATOR or SWEEP GENERATOR CONNECTION	SIGNAL GENERATOR or SWEEP GENERATOR FREQUENCY	RCVR. DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	AM ALIGNMENT					
3	High side through 0.001 mfd to antenna terminal. Common to chassis.	455 kHz (20 kHz Sweep)	Point of non·interference (on/about 600 kHz)	Connect vert. amp. of scope to TP_{401}.	T_{403} (1st IFT) (P) T_{404} (1st IFT) (S) T_{405} (2nd IFT) (P) T_{406} (2nd IFT) (S) T_{407} (3rd IFT)	Adjust for maximum output.
4	Fashion loop of several turns of wire and radiate signal into loop of receiver.	550 kHz (30% Mod. with 400 Hz)	550 kHz (15.2mm (19/32"))	Connect meter to main speaker terminals of set.	T_{402} (OSC Coil) L_{401} (ANT Coil) T_{401} (DET Coil)	Adjust for maximum output. Adjust L_{401} by ferrite core. Refer to fig. 1.
5	〃	1500 kHz (〃)	1500 kHz (138mm (5 7/16"))	〃	CT_{403} (OSC Trimmer) CT_{401} (ANT Trimmer) CT_{402} (DET Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
	AM SIGNAL METER ALIGNMENT					
6	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1000 kHz (30% Mod. with 400 Hz) 90dB/m	1000 kHz	Signal meter of set.	VR_{401}	Adjust for "3" signal meter indication.
	FM-IF AND MUTING CIRCUIT ALIGNMENT					
7	High side through 0.001 mfd to TP_{101}.	10.7 MHz (400kHz Sweep)	Point of non·interference. (on/about 90 MHz)	Connect vert. amp. of scope through detector to FM·IF p.c.b. TP_{201}. * Common to chassis. (Refer to fig. 2)	T_{101} (FM 1st IFT) (P) T_{102} (FM 1st IFT) (S)	Adjust for maximum amplitude and proper linearity between 100kHz markers. (Refer to fig. 3)
8	〃	〃	〃	Connect scope through detector to TP_{202}.	T_{202} (FM 3rd IFT) (P) T_{203} (FM 3rd IFT) (S)	〃
9	〃	〃	〃	Connect scope through detector to TP_{203}.	T_{204} (FM 4th IFT) (P) T_{205} (FM 4th IFT) (S)	〃
10	〃	〃	〃	Connect DC VTVM to TP_{206}⊕ and No. 206⊖ terminal of FM·IF p.c.b.	T_{207} (FM 5th IFT) (S)	Make sure that VTVM become OV.
11	〃	〃	〃	Connect vert. amp. of scope to TP_{204}.	T_{206} (FM 5th IFT) (P)	Adjust T_{206} so that 10.7 MHz marker appears at the center. (Refer to fig. 4)
12	〃	〃	〃	Connect vert amp. of scope to TP_{205}.	T_{208} (Muting IFT) (P) T_{209} (Muting IFT) (S)	Adjust for maximum sharp and proper linearity.

* Unsolder lead between test point TP 201 and point Ⓐ before alignment, and resolder it after alignment.

	SIGNAL GENERATOR		RCVR. DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTION	FREQUENCY				
	FM-RF ALIGNMENT					
13	Connect to FM antenna terminal through FM dummy antenna. (Refer to fig.5)	90 MHz (30% Mod. with 400 Hz)	90 MHz (19.4mm(¾"))	Output meter across speaker terminals.	L105 (FM OSC Coil) L104 (FM DET Coil) L103 (FM DET Coil) L102 (FM ANT Coil)	Adjust for maximum output.
14	〃	106MHz (〃)	106 MHz (130.2mm(5⅛"))	〃	Ct104 (FM OSC Trimmer) Ct103 (FM DET Trimmer) Ct102 (FM DET Trimmer) Ct101 (FM ANT Trimmer)	Adjust for maximum output. Repeat steps (13) and (14).
	FM SIGNAL METER ALIGNMENT					
15	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (100% Mod. with 400Hz) Output 60 dB	98 MHz	Signal meter of set.	VR201	Adjust for "5" signal meter indication. (Refer to fig. 6)
	MUTING LEVEL ALIGNMENT					
	Note: Muting switch —— ON					
16	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (100% Mod. with 400Hz) Output 28 dB	98 MHz	Output meter or speaker across speaker terminals.	VR202	Adjust so that output can be obtained.
	FM-MONO DISTORTION ALIGNMENT					
	Note: Muting switch —— OFF					
17	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (100% Mod. with 400Hz) Output 60 dB	98 MHz	Connect distortion meter to speaker terminals.	T206 (FM 5th IFT) (P)	Adjust for minimum distortion.

Notes:

Stereo-modulator —— Connect stereo-modulator output to EXT. MOD. terminal of signal generator. Internal OSC 1 kHz. Pilot signal modulation 10%.

Signal generator —— Frequency approximately 98 MHz. Output level 60 dB. Moduration mode FM.

1. Band selector —— FM-Auto (19 kHz Amp. Phase, Separation) FM-Mono (SCA, 19 kHz, 38 kHz Trap)
2. Bass and treble control —— Center
3. High, low filter switch —— OFF
4. Mode switch —— Stereo
5. Maintain line voltage at 120 volts.
6. Muting switch —— OFF
7. Loudness switch —— OFF
8. Speaker switch —— Main
9. Tape monitor switch —— Source
10. Dummy load —— 8 Ω, L and R Main terminal
11. Audio oscillator —— Effective to 0~100 kHz

SCA, 19kHz AND 38kHz TRAP ALIGNMENT

	SIGNAL GENERATOR CONNECTION	AF OSC FREQUENCY	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
18	FM antenna terminal thru. dummy antenna. (EXT. MOD.)	67 kHz (100% Mod.)	Output meter across speaker terminal.	T301 (SCA Trap Coil)	Adjust for minimum output.
19	〃	19 kHz (100% Mod.)	〃	T305 (19 kHz Trap Coil)	〃
20	〃	38 kHz (100% Mod.)	〃	T306 (38 kHz Trap Coil) T307 (38 kHz Trap Coil)	〃 (Left and Right side)

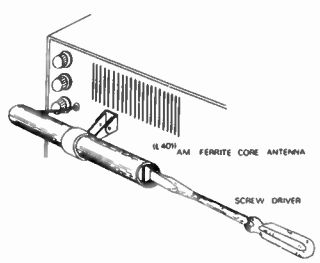


Fig. 1

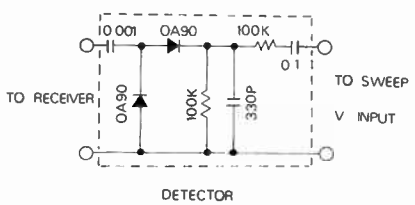


Fig. 2

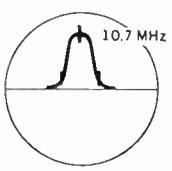


Fig. 3

19kHz AMPLIFIER AND PHASE ALIGNMENT				
SIGNAL GENERATOR CONNECTION	STEREO MODULATOR MODE and MOD RATE	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
FM antenna terminal thru. dummy antenna	Pilot 10	Connect scope to TP 301 Common to chassis	T301 (19kHz Pick up Coil) T303 (19kHz Doubler Coil)	Adjust for maximum scope pattern
〃	〃	Connect scope to TP 302 Common to chassis.	T304 (38kHz Output Coil)	〃
〃	L (or R) 100 %	Connect scope to speaker terminals.	T305 (19kHz pick up Coil)	Adjust for minimum right (or left) output
SEPARATION ALIGNMENT				
FM antenna terminal thru. dummy antenna.	L (and R) 30%	Output meter across speaker terminals through low pass filter. (Refer to fig 7)	VR301	Adjust for minimum right (and left) output

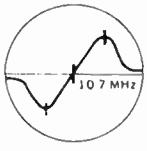


Fig. 4

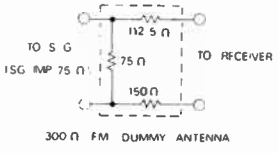


Fig. 5

Fig. 6

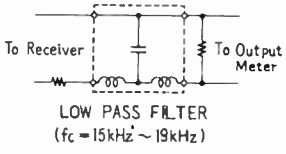
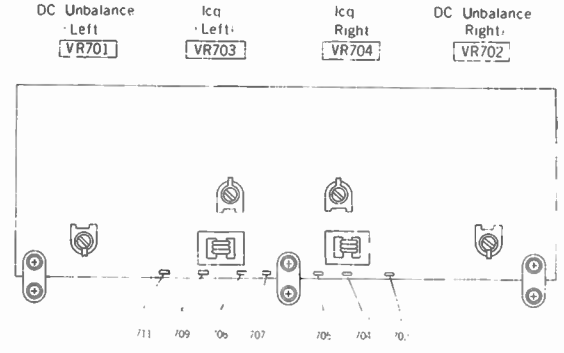
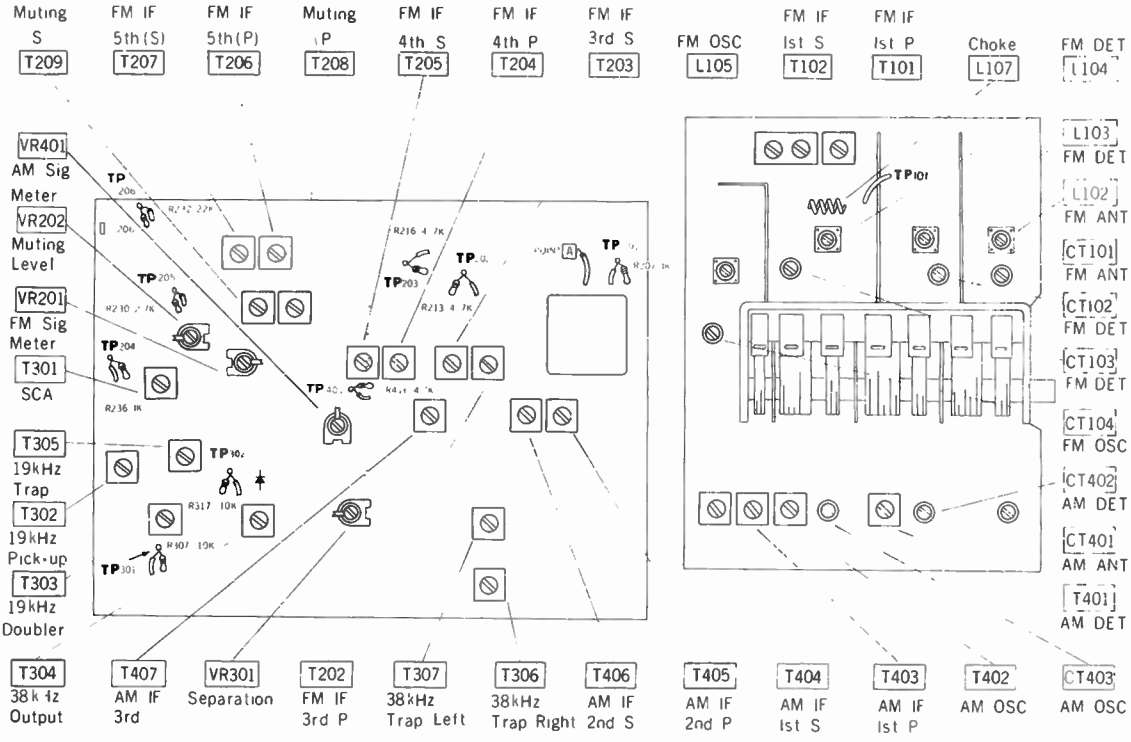


Fig. 7

ALIGNMENT POINTS



Driver p. c. b.



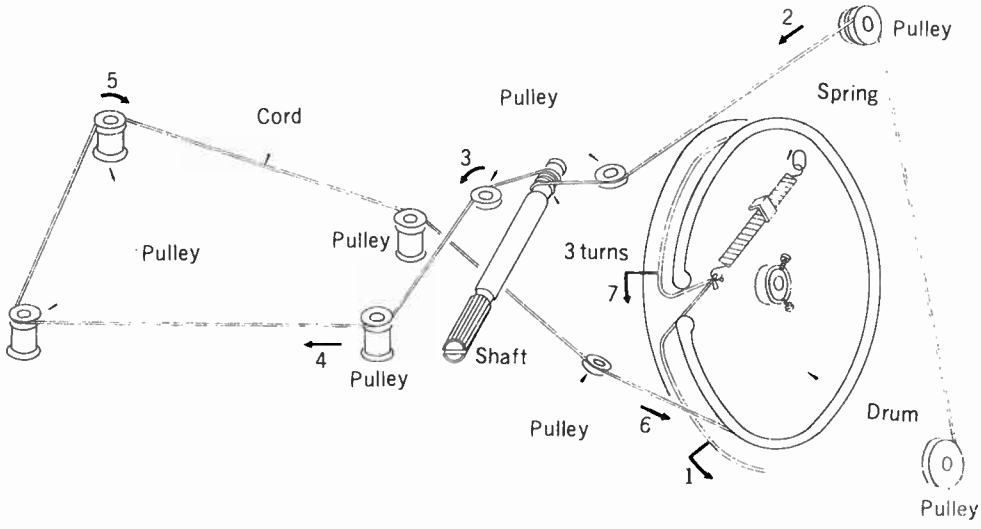
FM·AM-RF & IF, FM-MPX p. c. b.

■ DIAL CORD INSTALLATION GUIDE

1. Dial cord length is 63⅛" (160 cm).
2. Tuning gang is positioned at maximum capacity.
3. Arrow marks (1–7) indicate correct order and direction of stringing dial cord.
4. Cement dial cord ends.

■ TO MOUNT DIAL POINTER

1. Set tuning gang fully crossed position.
2. Bind dial indicator to dial pointer.
3. Set dial pointer to start point of dial scale.
4. Attach dial cord to dial pointer.



SEMICONDUCTORS

ITEM	PART NO./TYPE
D101	0A79
D102	0A79
D201	EYV320D1R2J3
D202	0A79
D203	0A79
D204	1S1211
D205	0A79
D206	2-0A79
D207	2-0A79
D301	2-0A79
D302	2-0A79
D303	2-0A79
D304	2-0A79
D305	2-0A79
D306	2-0A79
D401	0A79
D402	0A79
D403	EYV320D1R2J3
D701	RVDDS410
D702	RVDDS410
D703	RVDDS410
D704	RVDDS410
D705	RVDDS410
D706	RVDDS410
D707	RVDDS410
D708	RVDDS410
D709	RVDDS410
D710	RVDDS410
D801	RVDSD-1
D802	RVDSD-1
D803	MA242RC
D804	MA242RC
D805	MA242RC
D806	MA242RC
D807	RVD1N4737
IC201	AN203-AA,BA
TR101	3SK39Q
TR102	3SK39Q
TR103	2SC920Q
TR104	2SC920Q
TR201	2SC829C
TR202	2SC829C
TR203	2SC829C
TR204	2SC829C
TR705	2SA550A-Q,R
TR706	2SA550A-Q,R
TR707	2SC696A-A,B,D,E,H
TR708	2SC696A-A,B,D,E,H
TR709	2SC696A-A,B,D,E,H
TR710	2SA696A-A,B,D,E,H
TR711	2SA546A-A,B,D,E,H
TR712	2SA546A-A,B,D,E,H
TR713	2SD217L,M
TR714	2SD217L,M
TR715	2SD217L,M
TR716	2SD217L,M
TR801	2SA561Y,GR
TR802	2SA545L,K
TR205	2SC829C
TR206	2SC828Q,R
TR207	2SC828Q,R
TR301	2SC828Q,R
TR302	2SC828Q,R
TR303	2SA666P,Q
TR304	2SC828Q,R
TR305	2SB324-2
TR306	2SA666A-P,Q
TR307	2SA666A-P,Q
TR401	2SC920Q
TR402	2SC920Q
TR403	2SC829C
TR404	2SC829C
TR405	2SA666A-P,Q
TR501	2SA666A-P,Q
TR502	2SA666A-P,Q
TR503	2SC828AF-Q,R
TR504	2SC828AF-Q,R
TR601	2SA666A-P,Q
TR602	2SA666A-P,Q
TR603	2SA666A-P,Q
TR604	2SA666A-P,Q
TR701	2SA666A-1P,Q thru 2SA666A-7P,Q
TR702	2SA666A-1P,Q thru 2SA666A-7P,Q
TR703	2SA666A-1P,Q thru 2SA666A-7P,Q
TR704	2SA666A-1P,Q thru 2SA666A-7P,Q

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	VALUE	
C226	ECAG25ER22	.22mfd	25V
C228	ECEA25V4R7	4.7mfd	25V
C229	ECSY25EF2R2	2.2mfd	25V
C330	ECEA25V3R3	3.3mfd	25V
C232	ECEA16V220	220mfd	16V
C307	ECEA50V1	1mfd	50V
C308	ECEA16V47	47mfd	16V
C310	ECEA25V4R7	4.7mfd	25V
C311	ECEA25V4R7	4.7mfd	25V
C314	ECEA25V4R7	4.7mfd	25V
C316	ECEA25V4R7	4.7mfd	25V
C317	ECEA50V1	1mfd	50V
C318	ECEA10V33	33mfd	10V
C319	ECEA10V33	33mfd	10V
C320	ECEA50V1	1mfd	50V
C325	ECEA50V47	47mfd	50V
C327	ECAG25ER47	.47mfd	25V
C328	ECEA25V4R7	4.7mfd	25V
C329	ECEA6V100	100mfd	6.3V
C405	ECEA25V4R7	4.7mfd	25V

C407	ECEA10V10	10mfd	10V
C416	ECEA25V3R3	3.3mfd	25V
C421	ECEA16V100	100mfd	16V
C424	ECAG25ER47	.47mfd	25V
C425	ECEA10V33	33mfd	10V
C426	ECA25ER47	.47mfd	25V
C427	ECEA16V220	220mfd	16V
C501	ECSZ25EG3R3	3.3mfd	25V
C502	ECSZ25EG3R3	3.3mfd	25V
C505	ECEA6V100	100mfd	6.3V
C506	ECEA6V100	100mfd	6.3V
C507	ECEA6V100	100mfd	6.3V
C508	ECEA6V100	100mfd	6.3V
C511	ECEA6V47	47mfd	6.3V
C512	ECEA6V47	47mfd	6.3V
C519	ECEB50V470	470mfd	50V
C607	ECEA50V100	100mfd	50V
C608	ECEA50V100	100mfd	50V
C609	ECEA50V100	100mfd	50V
C610	ECEA50V1	1mfd	50V
C611	ECEA50V1	1mfd	50V
C612	ECEA6V100	100mfd	6.3V
C613	ECEA6V100	100mfd	6.3V
C620	ECEA16V10	10mfd	16V
C621	ECEA16V10	10mfd	16V
C624	ECSZ25EG1	1mfd	25V
C625	ECSZ25EG1	1mfd	25V
C628	ECEA6V100	100mfd	6.3V
C629	ECEA6V100	100mfd	6.3V
C630	ECEA50V47	47mfd	50V
C631	ECEA50V47	47mfd	50V
C632	ECEA50V47	47mfd	50V
C633	ECEA50V1	1mfd	50V
C634	ECEA50V1	1mfd	50V
C701	ECSY25EF1	1mfd	25V
C702	ECSY25EF1	1mfd	25V
C703	ECEA50V100	100mfd	50V
C704	ECEA50V100	100mfd	50V
C705	ECEA10V10	10mfd	10V
C706	ECEA10V10	10mfd	10V
C707	ECEA50V47	47mfd	50V
C708	ECEA50V47	47mfd	50V
C802	ECEB50V470	470mfd	50V
C808	ECEA50V220	220mfd	50V
C809	ECEA10V1000	1000mfd	10V
C810	ECEA50V100	100mfd	50V
C811	ECEM50R3300E	3300mfd	50V
C812	ECEM50R3300E	3300mfd	50V
C813	ECEA10V1000	1000mfd	10V
C901	ECEA16V47	47mfd	16V
CT10	ECV1ZW10P12	Trimmer	
CT102	ECV1ZW10P12	Trimmer	
CT103	ECV1ZW10P12	Trimmer	
CT104	ECV1ZW10P12	Trimmer	
CT401	ECV1ZW10P12	Trimmer	
CT402	ECV1ZW10P12	Trimmer	
CT403	ECV1ZW10P12	Trimmer	
CV101			
CV102			
CV103			
CV104	ECV1ZW10P12	Tuning Gang	
CV401			
CV402			
CV403			

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R745	ERU4PR39	.39 ohm 4W (Fusible)
R746	ERU4PR39	.39 ohm 4W (Fusible)
R747	ERU4PR39	.39 ohm 4W (Fusible)
R748	ERU4PR39	.39 ohm 4W (Fusible)
R751	ERU2P100	10 ohm 2W (Fusible)
R752	ERU2P100	10 ohm 2W (Fusible)
R753	ERD14FJ4R7	4.7 ohm 5% 1/4W
R754	ERD14FJ4R7	4.7 ohm 5% 1/4W
R803	ERG5PSK471	470 ohm 10% 5W
R914	ERM4P331	330 ohm 5% 4W WW
R915	ERM4P331	330 ohm 5% 4W WW
TH701	RRT-A202-2	Thermistor
TH702	RRT-A202-2	Thermistor
VR201	EVLS3AA00B14	10K FM Level
VR202	EVLS3AA00B54	50K Muting
VR301	EVLS3AA0B14	10K Separation
VR401	EVLS3AA0B14	10K AM Level
VR601 & VR602	RVVMD12254BH	250K Dual Balance
VR603 & VR604	RVVMD12T254B	250K Dual Volume
VR605 & VR606	RVVMD12104B	100K Dual Bass
VR607 & VR608	RVVMD12104B	100K Dual Treble
VR701	EVLS3AA00B23	2000 ohms DC Unbalance
VR702	EVLS3AA00B23	2000 ohms DC Unbalance
VR703	EVLS3AA00B13	1000 ohms ICQ
VR704	EVLS3AA00B13	1000 ohms ICQ

COILS/TRANSFORMERS

ITEM	PART NO.	ITEM	PART NO.
L101	SLAA4W1-2	T206	SLIA4C54
L102	SLAA4N3-Z	T207	SLIA4C56
L103	SLDA4N6-Z	T208	SLIA4C24
L104	SLDA4N7-Z	T209	SLIA4C24
L105	SLOA4N3-Z	T301	SLMA1C1-K
L106	SLQX151-1Y	T302	RLM1C4-K
L107	RLQY15G5	T303	RLM1C2-K
L201	SLQX151-1Y	T304	RLM1C5-K
L401	SLFA2E7-1	T305	RLM1C4-K
L402	ELQ393D5999G	T306	SLMA1C1-K
L701	SLEA5001-N	T307	SLMA1C1-K
L702	SLEA5001-N	T401	SLDA2C2
T101	SLIA4C110	T402	SLO2C2
T102	SLIA4D11	T403	RLI2C157-M
T201	SLIA4F11	T404	RLI2C157-M
T202	SLIA4C23	T405	RLI2C257-M
T203	SLIA4C23	T406	RLI2C257-M
T204	SLIA4C23	T407	RLI2C450-M
T205	SLIA4C23	T901	SLTA5R5S-W

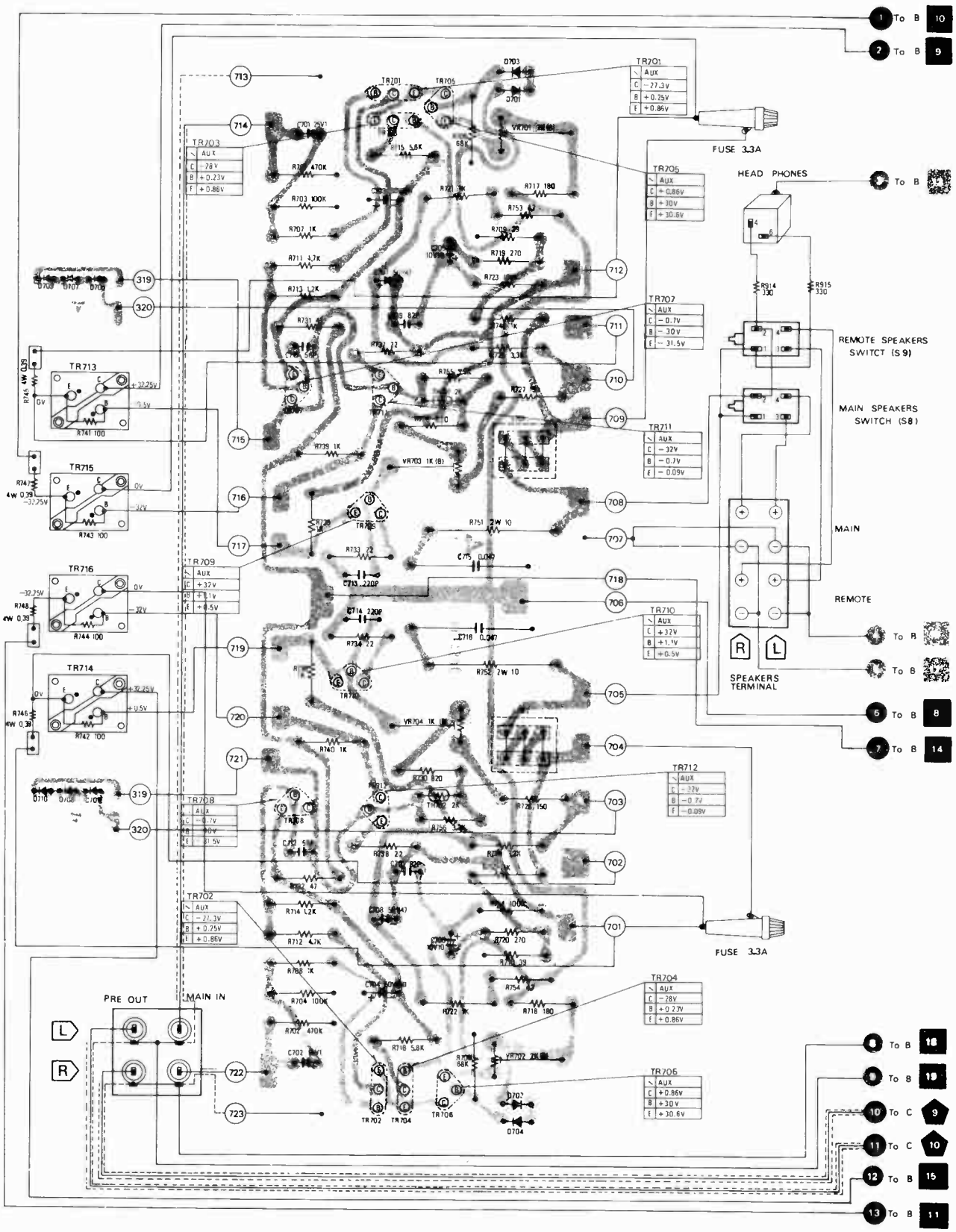
MISCELLANEOUS

ITEM	NAME	PART NO.
A3	Fuse, Speaker Protect (4A)	XBASIA4001
CH1	Meter, Signal	SSMA10
M201	Component Combination	EXA5DL04C
S1	Switch, Selector	SSRA6
S2	Switch, Tape Monitor	SSLA5S
S3	Switch, Tape Monitor	SSLA5S
S4	Switch, Loudness	SSLA4S
S5	Switch, High Filter	SSLA4S
S6	Switch, Mode	SSLA4S
S7	Switch, Muting	SSLA4S
S8	Switch, Main Speaker	SSLA4S
S9	Switch, Remote Speaker	SSLA4S
S10	Switch, Power	SSHAGS
	Fuse, 3A, Power Supply	XBASIB3003
	P.C. Board, FM/AM Tuner	SUPA771
	P.C. Board, IF/MPX	SUPA760
	P.C. Board, Equalizer/Control Amp	SUPA840
	P.C. Board, Driver/Main Amp	SUPA850
	P.C. Board, Thermal Compensation	SUPA651
	P.C. Board, Power Supply	SUPA870

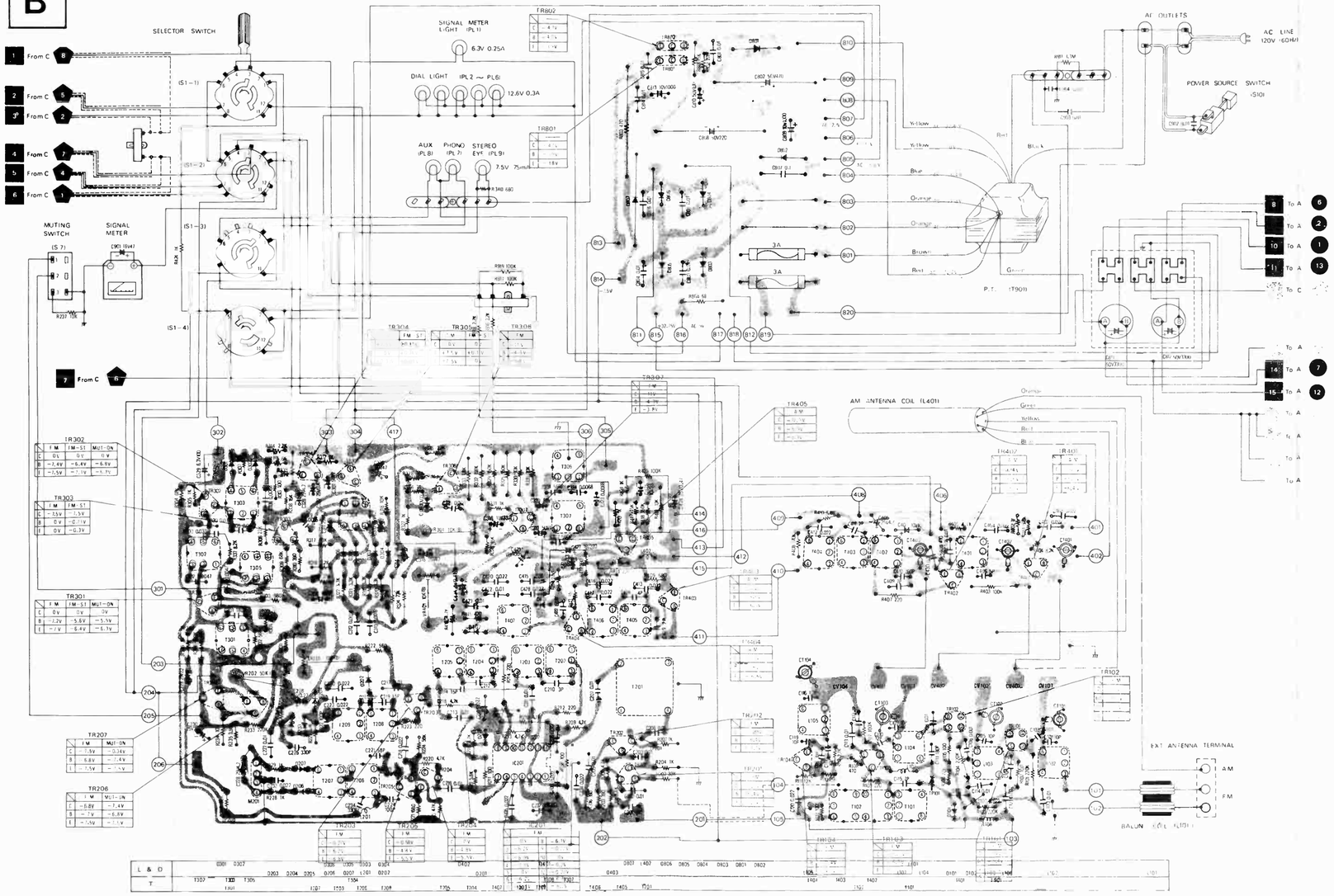
CABINET PARTS

NAME	PART NO.
Assembly, Cabinet	SKAA320S
Panel, Front	SYEA13S
Panel, Rear	SMNA118
Button, Power/Speaker	SBCA27
Knob, Bass/Treble/Balance/Volume	SBCA30-1
Knob, Loudness/Low Filter/High Filter/ Muting/Mode/Tape Monitor	SBCA29
Knob, Selector	SBNA33
Knob, Tuning	SBNA42

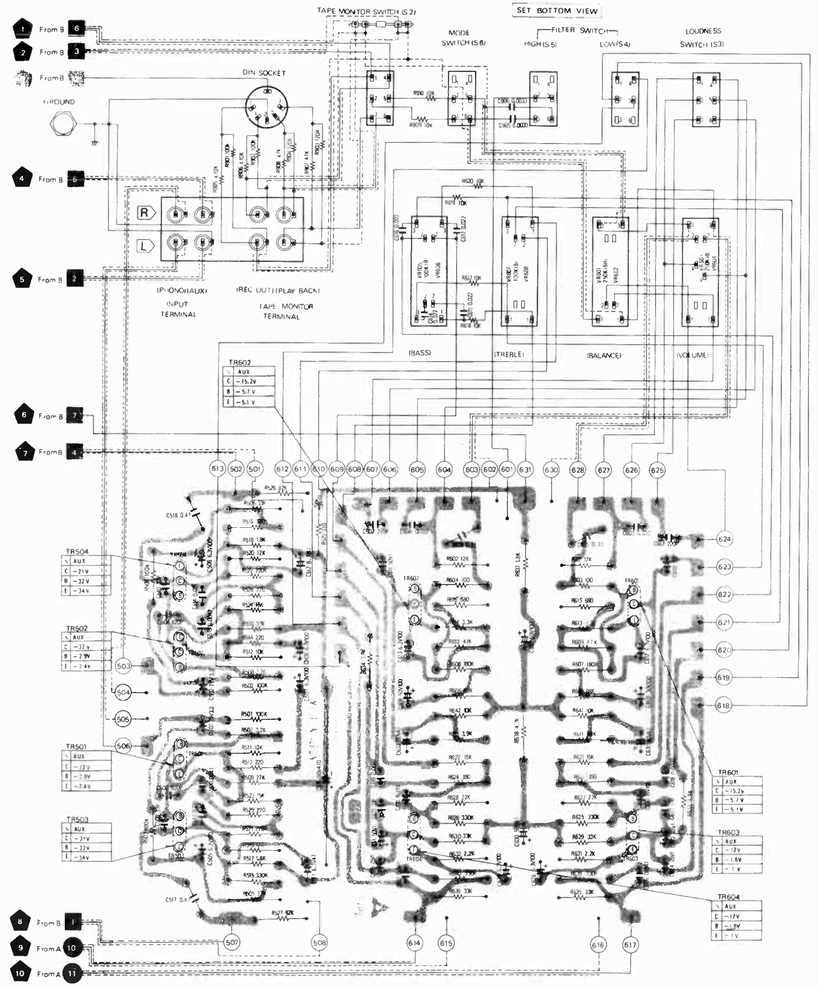
A Driver, Main Circuit Board

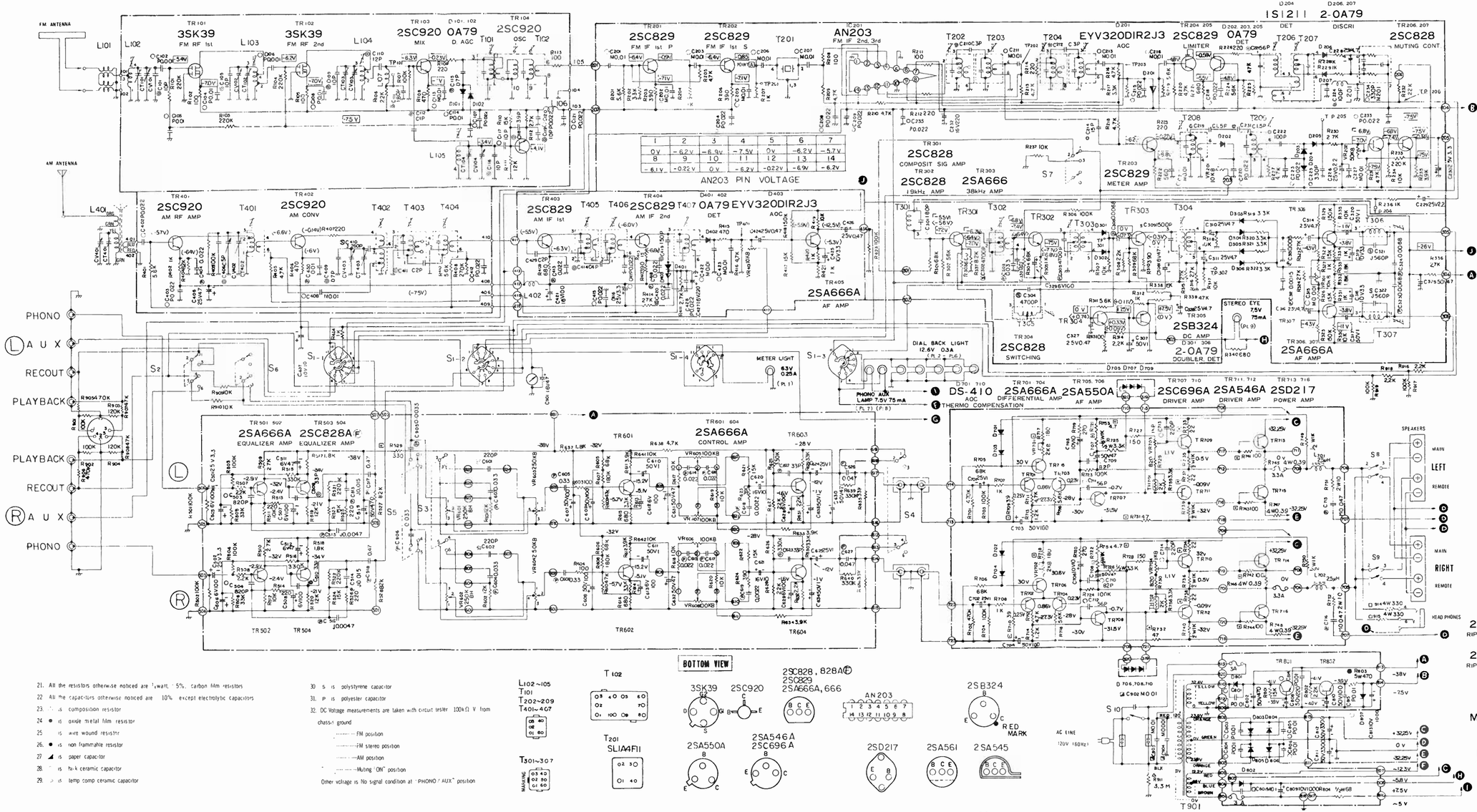


B FM·AM Tuner, MPX & Power Supply Circuit Board



C Control Circuit Board





Notes :

1. S1-1 ~ S1-4 : Selector switch in "PHONO" position
   PHONO-FM-AUTO-FM-MONO-AM-AUX
2. S2 : Tape monitor switch in "SOURCE" Position
3. S3 : Loudness switch in "OFF" position
4. S4 : Low filter switch in "OFF" position
5. S5 : High filter switch in "OFF" position
6. S6 : Mode switch in "STEREO" position
7. S7 : Muting switch in "ON" position
8. S8 : Main speakers switch in "OFF" position
9. S9 : Remote speakers switch in "OFF" position
10. S10 : Power source switch in "OFF" position

11. VR401 : FM signal level meter adjustment
12. VR402 : Muting level adjustment
13. VR403 : Mpx separation adjustment
14. VR404 : AM signal level meter adjustment
15. VR405 : Balance control
16. VR406 ~ 408 : Volume control
17. VR409 : Bass control
18. VR410 : Treble control
19. VR411 : DC unbalance adjustment
20. VR501 ~ 504 : Tone adjustment

21. All the resistors otherwise noticed are 1/4watt, ±5%, carbon film resistors
22. All the capacitors otherwise noticed are ±10% except electrolytic capacitors
23. ▭ is composition resistor
24. ● is oxide metal film resistor
25. ▭ is wire wound resistor
26. ● is non frammable resistor
27. ◢ is paper capacitor
28. ▭ is mica ceramic capacitor
29. ▷ is temp comp ceramic capacitor
30. S is polystyrene capacitor
31. P is polyester capacitor
32. DC Voltage measurements are taken with circuit tester 100kΩ V from chassis ground
    ·····FM position
    ·····FM stereo position
    ·····AM position
    ·····Muting "ON" position
    Other voltage is No signal condition at "PHONO / AUX" position

Pages 93-102 Courtesy of J. C. PENNEY CO., INC.

PRESSURE OF PRESSURE ROLLER

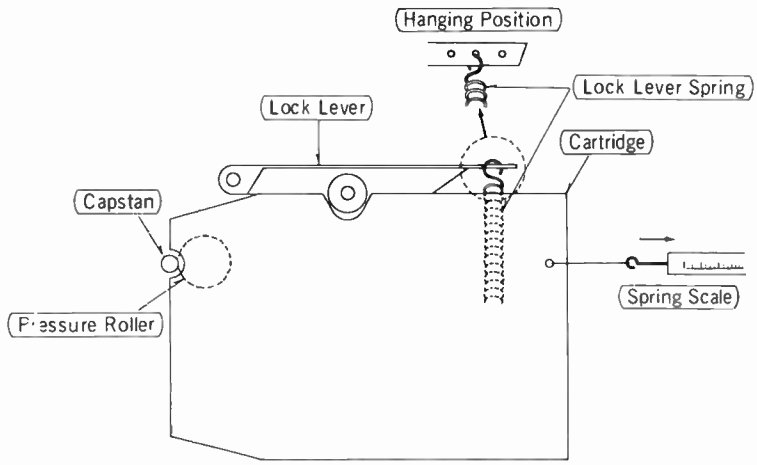


FIGURE 7

Instrument required: Standard cartridge for measuring pressure of pressure roller, spring scale.

Measuring figure: Refer to figure 7.

Measuring method: Insert the standard cartridge in the tape player, and take the measurement by pulling it with the spring scale as shown in figure 7

Standard value: 1750±200 gr.

Adjustment: Make adjustment with the Lock lever spring. Chauge hanging position of lock-lever.

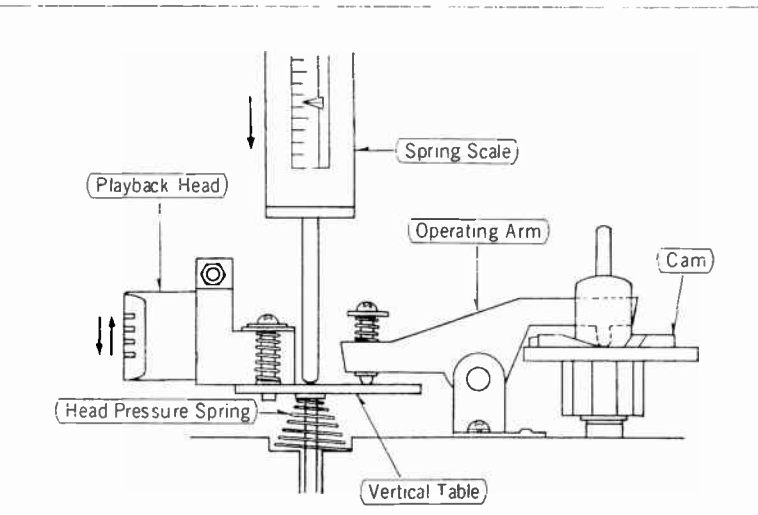


FIGURE 8

Instrument required: Spring scale.

Measuring figure: Refer to figure 8.

Measuring method: Place the set into the mode of program 1, and the take the measurement by push it downward with the spring scale as shown in figure 8.

Standard value: 180±20 gr.

PLUNGER LOAD

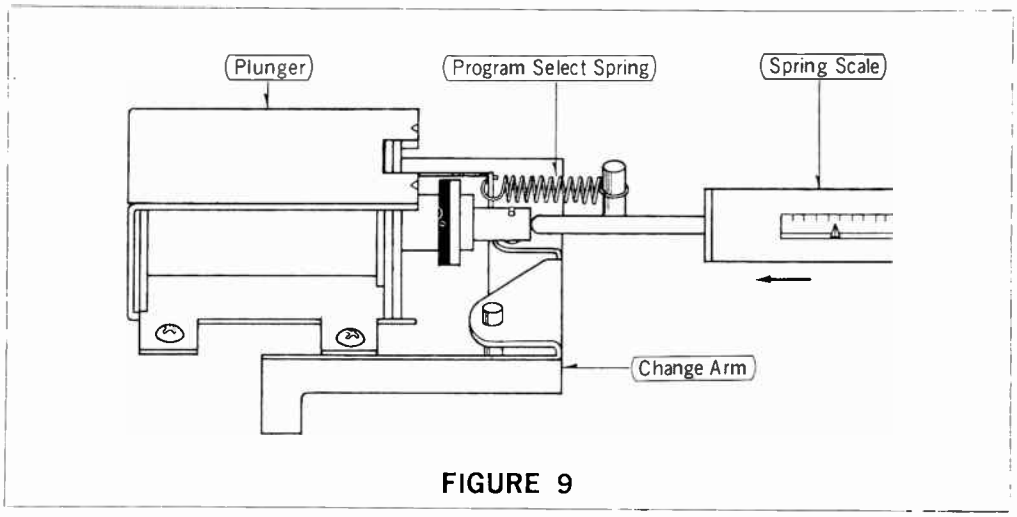


FIGURE 9

Instrument required: Spring scale.
Measuring figure: Refer to figure 9.
Measuring method: Apply the spring scale as shown in figure 9, push in the plunger, and measure the maximum value at the end point.

Standard value: 700±100 gr.
Adjustment: Make the adjustment by using the program select spring.

ADJUSTMENTS

HEAD HEIGHT POSITION CONTROL AND ANGLE ADJUSTMENT

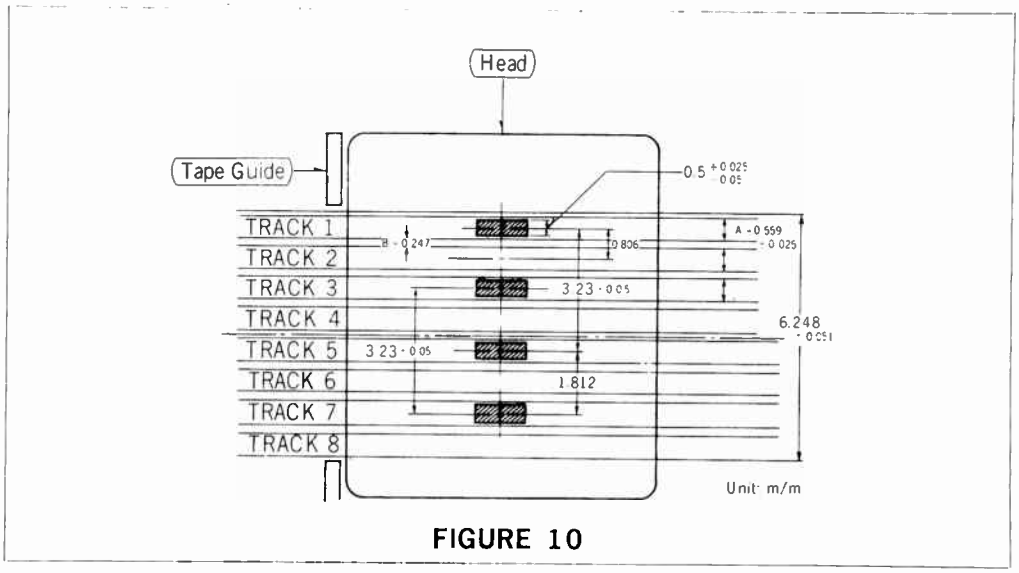


FIGURE 10

Instruments required: VTVM (2 units) Angle adjustment standard tape (VTT 809 or #326 made by RCA).
Height posision control tape VTT801 or #321 made by RCA).
Crosstalk adjustment standard tape (VTT 804 or #328 made by RCA).

HEAD POSITION CONTROL

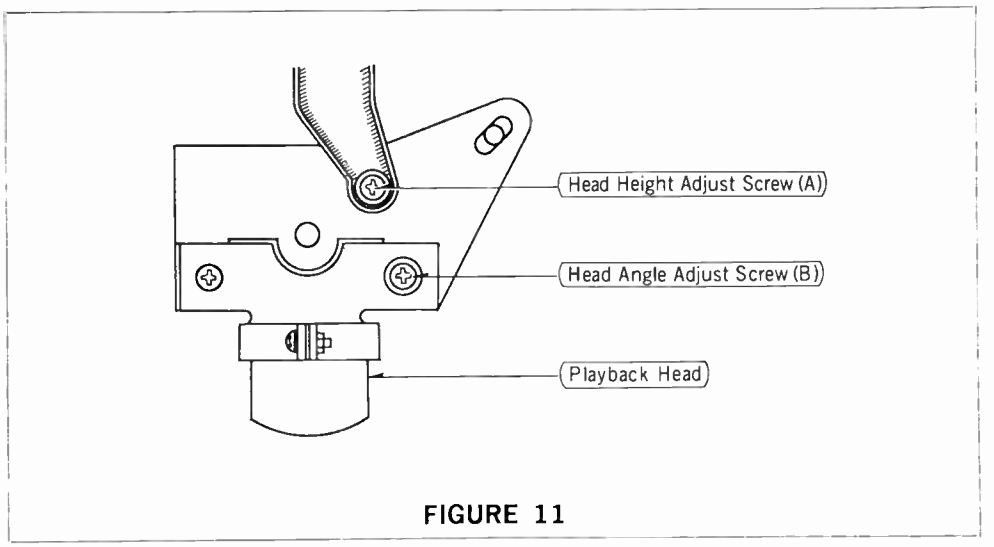


FIGURE 11

1. Place the set into the mode of program 1.
2. Make an adjustment with the unaided eye by using the adiustment screw (A) shown in figure 11, so that the tape width and the head position becomes as shown in figure 10.

ANGLE ADJUSTMENT

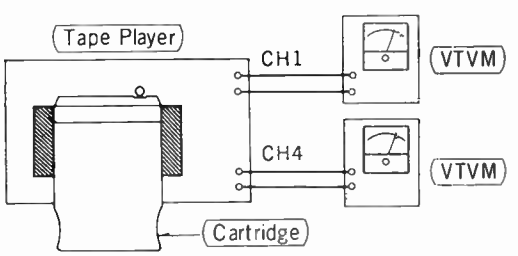


FIGURE 12

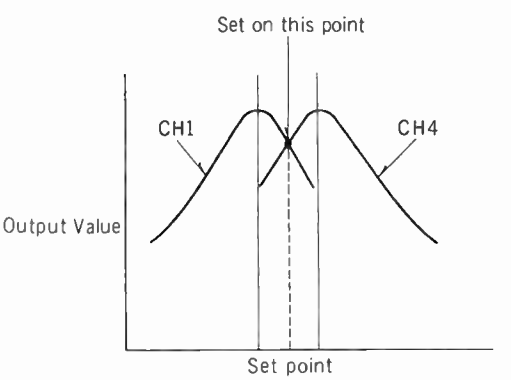


FIGURE 13

1. Place the set into the mode of prgram 1.and playback the angle adjustment standard tape.
2. Connect 2 VTVMs to the line outputs of CH1 and CH4 so that both output values can be measured.
3. Adjust the head angle adjust screw (B) shown in figure 5 so that both output values become maximum simultaneously.
4. When the both values are not muximum on the same point, set it on the point where the both values are equal as shown in figure 13.

HEIGHT POSITION CONTROL

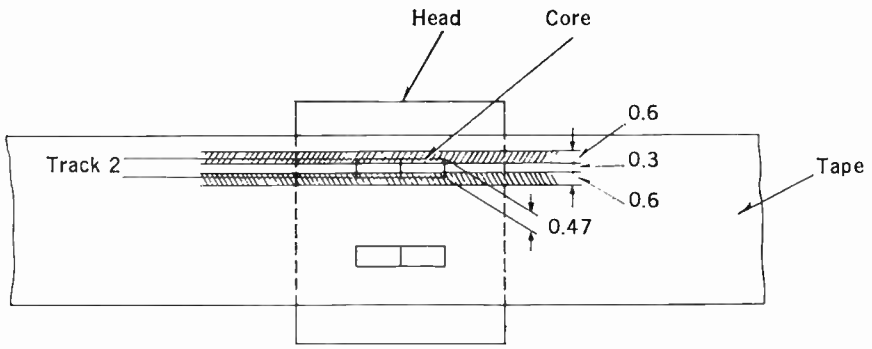


FIGURE 14

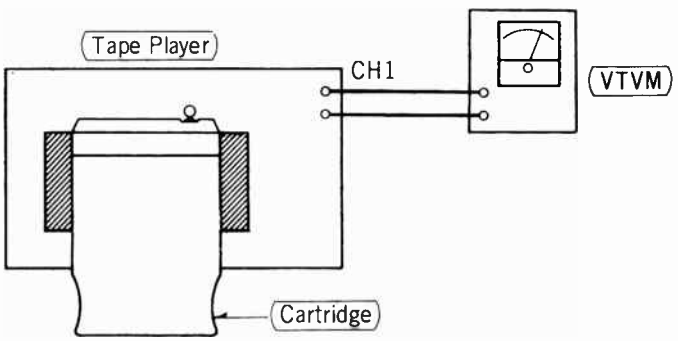


FIGURE 15

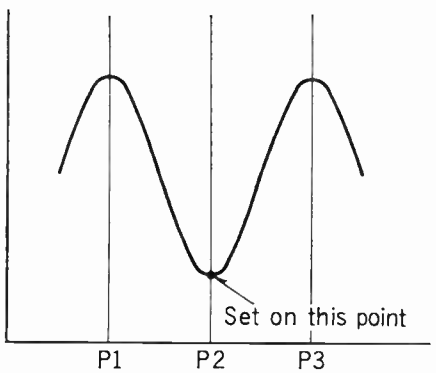
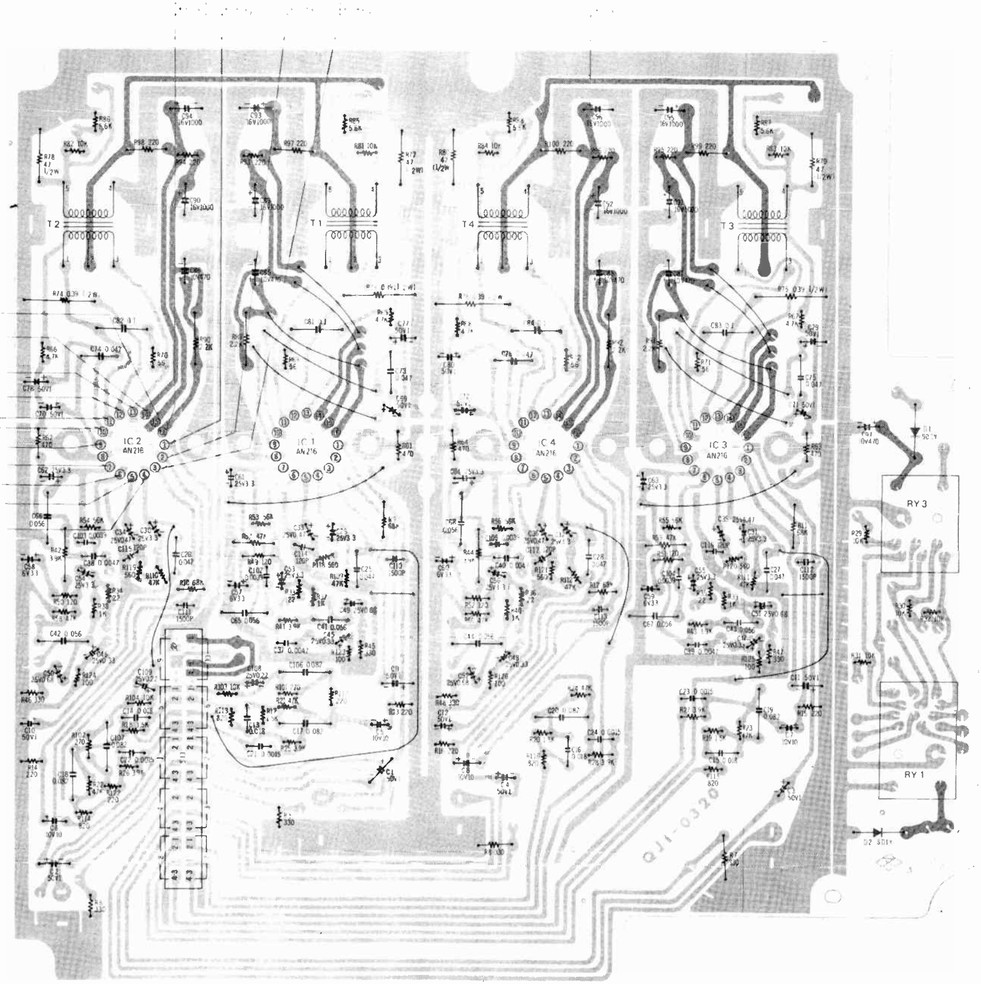


FIGURE 16

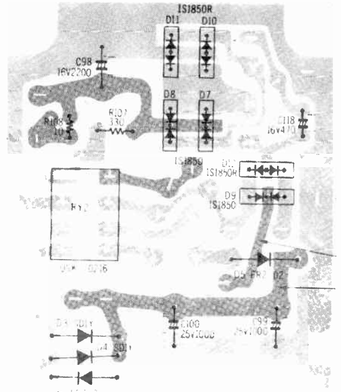
The tape has two 1 kHz signals with opposite phase recorded above and below track 2 as shown in figure 14.

1. Place the set to the program 2.
2. Connect the VTVM to the output of CH1 as shown in figure 15.
3. Playback the height position control tape.
4. When turn the head height adjust screw (A) in figure 5, comfirm that the output varies as maximum→minimum→maximum as shown in figure 16.
5. Set the adjust screw (A) at the minimum point.

MAIN CIRCUIT BOARD



RECTIFIER CIRCUIT BOARD



SEMICONDUCTORS

ITEM	PART NO./TYPE		
D1	SD1Y	D9	1S1850
D2	SD1Y	D10	1S1850R
D3	SD1Y	D11	1S1850R
D4	SD1Y	D12	1S1850R
D5	FR202	IC1	AN216
D6	FR202	IC2	AN216
D7	1S1850	IC3	AN216
D8	1S1850	IC4	AN216

ELECTROLYTIC CAPS

ITEM	PART NO.	VALUE	
C1	ECEA50V1N	1mfd	50V
C2	ECEA50V1N	1mfd	50V
C3	ECEA50V1N	1mfd	50V
C4	ECEA50V1N	1mfd	50V
C5	ECEA10V10N	10mfd	10V
C6	ECEA10V10N	10mfd	10V
C7	ECEA10V10N	10mfd	10V
C8	ECEA10V10N	10mfd	10V
C9	ECEA50V1N	1mfd	50V
C10	ECEA50V1N	1mfd	50V
C11	ECEA50V1N	1mfd	50V
C12	ECEA50V1N	1mfd	50V
C29	ECEA25V3R3N	3.3mfd	25V
C30	ECEA25V3R3N	3.3mfd	25V
C31	ECEA25V3R3N	3.3mfd	25V
C32	ECEA25V3R3N	3.3mfd	25V
C33	ECAG25ER47	.47mfd	25V
C34	ECAG25ER47	.47mfd	25V
C35	ECAG25ER47	.47mfd	25V
C36	ECAG25ER47	.47mfd	25V
C45	ECAG25ER33	.33mfd	25V
C46	ECAG25ER33	.33mfd	25V
C47	ECAG25ER33	.33mfd	25V
C48	ECAG25ER33	.33mfd	25V
C49	ECAG25ER68	.68mfd	25V
C50	ECAG25ER68	.68mfd	25V
C51	ECAG25ER68	.68mfd	25V
C52	ECAG25ER68	.68mfd	25V
C53	ECEA25V3R3N	3.3mfd	25V
C54	ECEA25V3R3N	3.3mfd	25V
C55	ECEA25V3R3N	3.3mfd	25V
C56	ECEA25V3R3N	3.3mfd	25V
C57	ECEA6V33N	33mfd	6V
C58	ECEA6V33N	33mfd	6V
C59	ECEA6V33N	33mfd	6V
C60	ECEA6V33N	33mfd	6V
C61	ECEA25V3R3N	3.3mfd	25V
C62	ECEA25V3R3N	3.3mfd	25V
C63	ECEA25V3R3N	3.3mfd	25V
C64	ECEA25V3R3N	3.3mfd	25V
C69	ECEA50V1N	1mfd	50V
C70	ECEA50V1N	1mfd	50V
C71	ECEA50V1N	1mfd	50V
C72	ECEA50V1N	1mfd	50V
C77	ECEA50V1N	1mfd	50V
C78	ECEA50V1N	1mfd	50V
C79	ECEA50V1N	1mfd	50V
C80	ECEA50V1N	1mfd	50V
C85	ECEA10V470N	470mfd	10V
C86	ECEA10V470N	470mfd	10V
C87	ECEA10V470N	470mfd	10V
C88	ECEA10V470N	470mfd	10V
C89	ECEA16V1000N	1000mfd	16V
C90	ECEA16V1000N	1000mfd	16V
C91	ECEA16V1000N	1000mfd	16V
C92	ECEA16V1000N	1000mfd	16V
C93	ECEA16V1000N	1000mfd	16V
C94	ECEA16V1000N	1000mfd	16V
C95	ECEA16V1000N	1000mfd	16V
C96	ECEA16V1000N	1000mfd	16V
C97	ECEA10V470N	470mfd	10V
C98	ECEA16V2200N	2200mfd	16V
C99	ECEA25V1000N	1000mfd	25V
C100	ECEA25V1000N	1000mfd	25V
C108	ECAG25ER22	.22mfd	25V
C109	ECAG25ER22	.22mfd	25V
C118	ECEA16V470N	470mfd	16V
C119	ECEB25Y2R2	2.2mfd	25V
C120	ECEB25Y2R2	2.2mfd	25V
C121	ECEB25Y2R2	2.2mfd	25V
C122	ECEB25Y2R2	2.2mfd	25V

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R73	ERM12PR39	.39 ohms 1/2W WW
R74	ERM12PR39	.39 ohms 1/2W WW
R75	ERM12PR39	.39 ohms 1/2W WW
R76	ERM12PR39	.39 ohms 1/2W WW
VR1	EN4A2AF2V7F8	20K Dual Volume
VR2	EN4A2AF2V7F8	20K Dual Volume
VR3	EVIAOAN28B54	50K Bass (Quad)
VR4	EVIAOAN28A54	50K Treble (Quad)

COILS/TRANSFORMERS

ITEM	PART NO.
T1	QLA0371
T2	QLA0371
T3	QLA0371
T4	QLA0371
T5	QPO561S

MISCELLANEOUS

ITEM	NAME	PART NO.
CR1	Component Combination	QCR0002
E1	Head, Play	WY804
E2	Speaker, Woofer	EAS16PL84S
E3	Speaker, Tweeter	EAS6SPH14S
E4	Assembly, Program Indicator	XAM04S
E5	P.C. Board, Amplifier	QEI0319
E6	P.C. Board, Power	QEI0330
RY1	Relay	QSK0409
RY2	Relay	QSK0216
RY3	Relay	QSK0217
S1	Switch, Power	ESB1134SU
S2	Switch, Detector	QSB0184
S3	Switch, Program Indicator	ESE129
S4	Switch, Micro	QSM0040
S5	Switch, Program Select	QSW0116S
S6	Switch, Sensing	QSW0116S
S8	Switch, Auto Eject	QST0016S
S9	Switch, Motor On/Off	QSB0184
S13	Switch, Mode Select	QSR0007

CABINET PARTS

NAME	PART NO.
Assembly, Cabinet	QYB0259
Board, Side	QKQ1060
Board, Bottom	QKU1104
Assembly, Panel	QYP0296
Lid, Cartridge	QFK1100
Assembly, Push-button (Eject/Program Select)	QYT0216
Assembly, Push-button (Power)	QYT0217
Knob, Outer Control	QGT3021
Knob, Inner Control	QGT3022
Knob, Selector	QGT3023
Assembly, Speaker Cabinet	QUJ1262
Board, Speaker Cabinet Rear	QKS5074

CROSSTALK

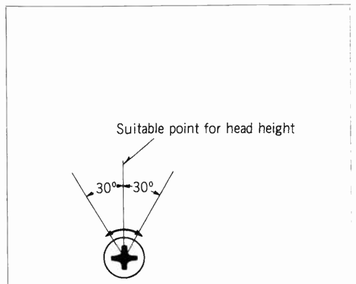


FIGURE 17

1. Measure the crosstalk between the adjacent tracks by playback the crosstalk adjustment tape.
   As for the crosstalk adjustment tape, signals of 400 Hz are recorded on tracks 1, 3, 5 and 7 and no signal on tracks 2, 4, 6 and 8.
2. Connect the VTVM to output of CH1 as shown in figure 15.
3. Playback the adjustment tape, change the program in turn and obtain the output ratio of the adjacent tracks.
4. The standard value is higher than 45 db.
5. If the value is less than 45 db, re-adjust the items height position control and angle adjustment above, and take the measurement over again.
6. Even if adjusted item 5 above, when the value is out of the standard, slightly adjust the head height adjust screw (A) but within 30 degrees far from the suitable point for head height as show in figure 17.

PLAYBACK AMPLIFIER GAIN

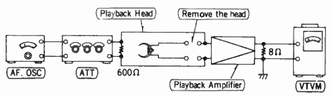


FIGURE 18

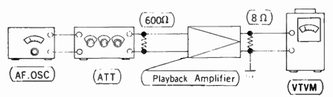


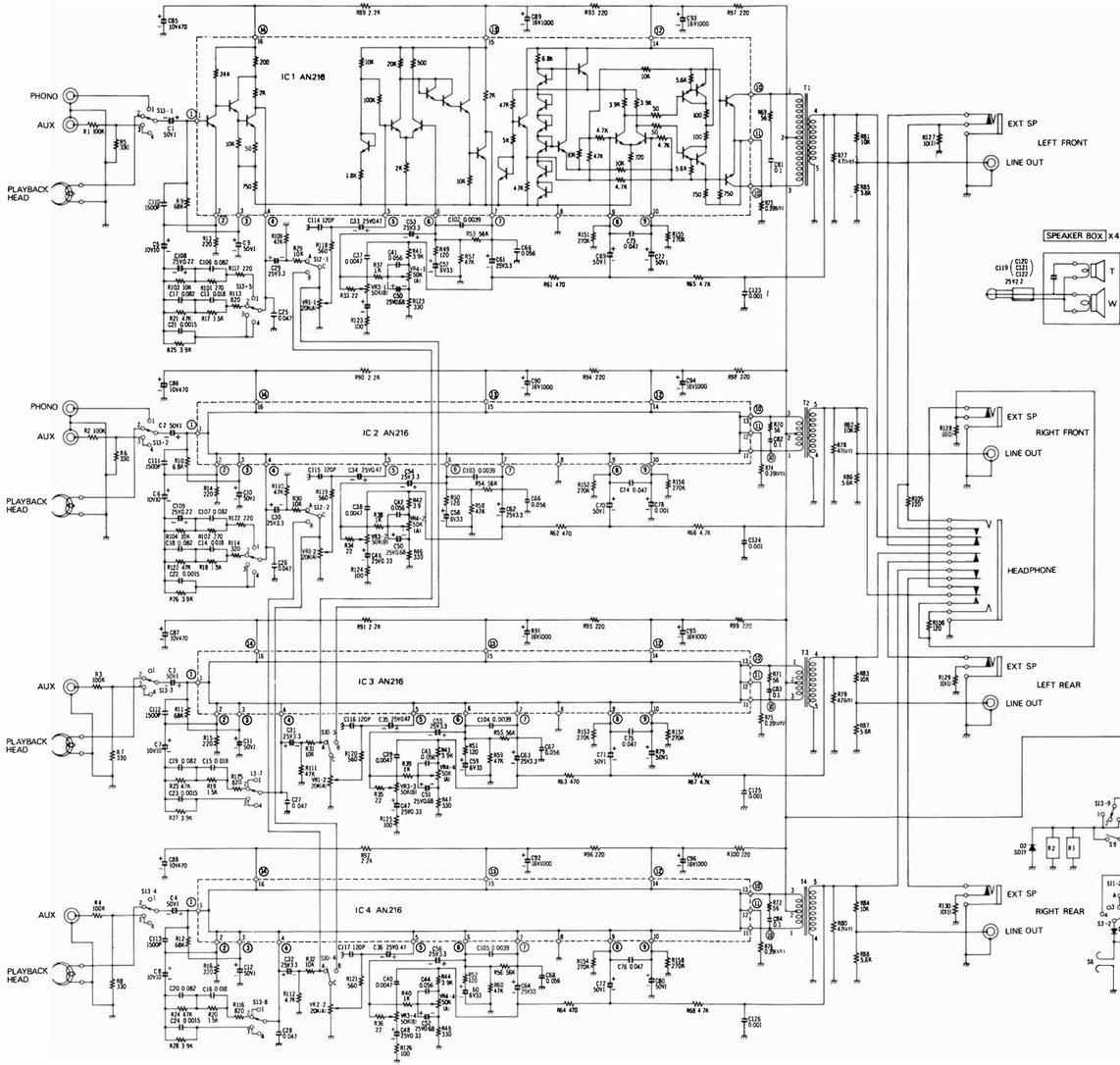
FIGURE 19

Instruments required: AF OSC, ATT, VTVM, Resistors (8Ω, 600Ω).

1. Tape
   a. Set the mode selector to 8 track.
   b. Supply the input signal of 1 kHz, −80 ±2 db to head lead wire as shown in figure 18.
   c. The standard voltage value is 1 v on VTVM connected EXT SP jack.
2. AUX
   a. Set the mode selector to AUX.
   b. Supply the input signal of 1 kHz, −32 ±3 db to AUX input jack as shown in figure 19.
   c. The standard voltage value is 1 v.
3. Phono
   a. Set the mode selector to phono.
   b. Supply the input signal of 1 kHz, −69 ±3 db to phono input jack.
   c. The standard voltage value is 1 v.

NOTE:

1. Take a measurement for each channel in the same way as above.
2. Set the volume control to maximum and treble and bass control to center.



STANDARD VOLTAGE CHART

Check point	Voltage value	Check point	Voltage value
①	+0.67 V	⑨	+13 V
②	+0.05 V	⑩	0 V
③	+0.8 V	⑪	+10.5 V
④	+4.2 V	⑫	+9.0 V
⑤	+1.8 V	⑬	+6.2 V
⑥	+1.8 V	⑭	+13 V
⑦	+4.0 V	⑮	+13 V
⑧	+1.2 V	⑯	+22 V
⑧	+1.2 V		

NOTE: All measurements are under no signal conditions with volume at minimum position.
Use P-type VTVM for voltage measurements.

NOTE:

1. S1 ..... Power ON-OFF position.
2. S2 ..... Motor ON-OFF switch (ON : when cartridge is inserted)
3. S3-1—S3-2 ..... Program indicator switch.
4. S4 ..... Relay (RY3) Function switch (a position when program 1, 2 or 3 of 2ch, b position when others).
5. S5 ..... Program select switch.
6. S6 ..... Sensing switch.
7. S7 ..... Manual eject switch.
8. S8 ..... Auto eject switch.
9. S9 ..... 4ch/2ch detecting switch (OFF when 4ch, ON when 2ch).
10. S10-1—S10-4 ..... Relay (RY1) switch (a position when 4ch, b position when 2ch).
11. S11-1, S11-2 ..... Relay (RY2) switch (a position when 4ch, b position when 2ch).
12. S12-1, S12-2 ..... Relay (RY3) switch (b position when track 3 or 4 of 2ch, a position when others).
13. S13-1—S13-10 ..... Mode select switch (1 : Phone, 2 : Tape, 3 : AUX-2ch, 4 : AUX-4ch).
14. VR1-1, VR1-2 ..... Front-channel volume control.
15. VR2-1, VR2-2 ..... Rear- channel volume control.
16. VR3-1—VR3-4 ..... Treble control.
17. VR4-1—VR4-4 ..... Bass control.
18. Resistors are ohms (Ω), 1/4 watt unless specified otherwise.
    K : 1,000Ω, M : 1,000,000Ω.
    Bracksted numbers, followed the resistors, show the wattage of the resistor.
19. Capacitors are microfarads (μF) unless specified otherwise.
    P : Micro-microfarads
20. Encircled numbers (◯) show the checkpoints for voltage. The values are marked in the standard voltage chart.

NOTE:
In the schematic diagram, resistors 270 kΩ (R151, 152, 153, 154, 155, 156, 157, 158) each with a ◆ mark are stated between IC terminals No. 9, No. 10 and the ground.
This is referable to the fact that ICs were ranked in the early period and these resistors (270 kΩ) have hitherto been used in some cases and not used in the other cases, depend on the rank.
The IC rank is recognized by the part name ink color (black or red) printed on the IC. For only IC of red ink, the resistors (270 kΩ) are used.
When, in service, using IC of black ink replacing the IC of red ink, please also remove the resistors (270 kΩ) connected to terminals No. 9 and No. 10.

AM and FM ALIGNMENT PROCEDURE

INSTRUMENTS REQUIRED

1. RF Signal/Sweep Generator (RCA WR-50C or equivalent) or TV/FM Sweep Generator (RCA WR 69A or equivalent)
2. Marker Generator (RCA WR-99A or equivalent)
3. Marker Adder (RCA WR-70A or equivalent)

Output Indicators

4. Oscilloscope (RCA WO-91A or equivalent)
5. Vacuum Tube Voltmeter (RCA WV-98C or equivalent)

GENERAL ALIGNMENT CONDITIONS

1. Signal input must be kept as low as possible to avoid AGC and limiting action (Use highest sensitivity of output indicator).
2. Markers must be accurate (crystal controlled or checked) and must not distort oscilloscope trace.
3. Standard modulation is 400 Hz at 30% amplitude.
4. Set volume control at maximum unless otherwise indicated

Step	Signal Source—	Output Indicator—	Set Signal to—	Set Radio Dial to—	Adjust	Adjust for—
1	Set Function Switch on AM					
2	Sig. Gen.— connected to a Loop or Short piece of wire placed near AM antenna	V.T.V.M.— connected across speaker voice coil	455 KHz (modulated)	Quiet point on band	T110 (3rd AM IF)	Maximum
3					T107, T108 (2nd AM IF)	
4					T105 (1st AM IF)	
5			550 KHz (modulated)	550 KHz	L107 (AM osc. coil)	
6			1600 KHz (modulated)	1600 KHz	CT105 (AM osc. trim)	
7			600 KHz (modulated)	600 KHz (rock gang)	L106 (AM ant. coil)	
8			1400 KHz (modulated)	1400 KHz (rock gang)	CT104 (AM ant. trim)	
9	Repeat steps 2 thru 8 as necessary to obtain maximum sensitivity					
10	Set Function Switch on FM					
11	Sweep Gen.— connected to TP1 & Ground thru a 0.04 μf cap. & 2.2k in series in each lead	Oscilloscope— connected to TP3 & ground through network	107 MHz with 10.6; 10.7 10.8 MHz markers	Quiet point on band (R017 at minimum)	Detune T112 (Toward Top)	Maximum gain with symmetrical curve centered at 10.7 MHz with 10.6 & 10.8 MHz markers at approx. 10%, but not more than 25%, down slope of curve
12					T111 (5th FM IF)	
13					T109 (4th FM IF)	
14					T106 (3rd FM IF)	
15					T104 (2nd RM IF)	
16					T102, T103 (1st FM IF)	
17					T111 (5th FM IF)	Retouch to obtain optimum symmetrical response
18					T112 (Demodulator)	Symmetrical "S" curve centered at 10.7 MHz
19	Marker Gen.— loosely coupled to FM antenna	V.T.V.M.— connected across speaker voice coil (R017-max.)	88 MHz (modulated)	88 MHz	L105 (FM osc. coil)	Maximum
20			108 MHz (modulated)	108 MHz	CT103 (FM osc. trim)	
21			90 MHz (modulated)	90 MHz	L102 (FM ant. coil)	
22					L103 (FM RF coil)	
23			106 MHz (modulated)	106 MHz	CT101 (FM ant. trim)	
24					CT102 (FM RF trim)	
25	Repeat steps 11 thru 24 as necessary to obtain maximum sensitivity and symmetry					

MULTIPLEX ALIGNMENT PROCEDURE

INSTRUMENTS REQUIRED

Signal Source

1. FM-Stereo Simulator (RCA WR-52A or equivalent)

Output Indicator

2. Oscilloscope (RCA WO-91B or equivalent)

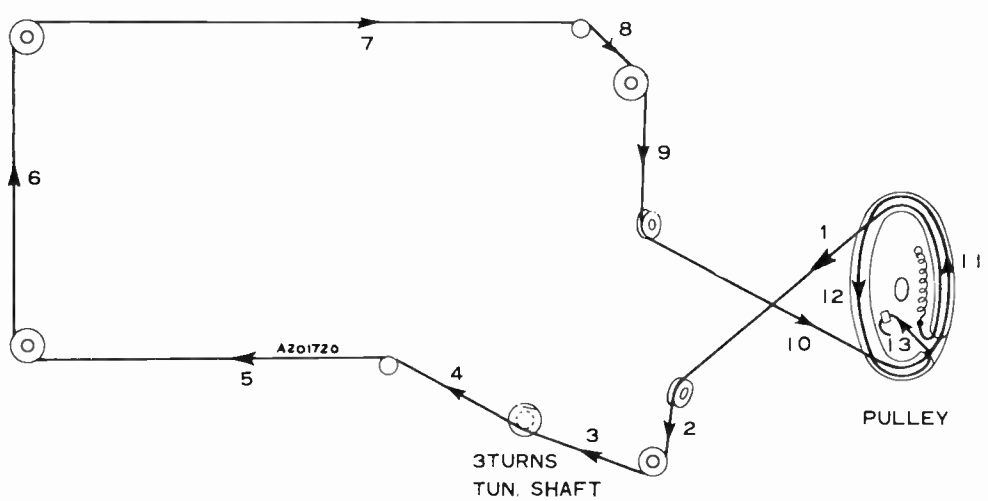
Tools

3. Hex head alignment tool
4. Non-magnetic screwdriver

GENERAL ALIGNMENT CONDITIONS

1. Connect low side of output indicator to chassis ground as close as possible to high side connection.
2. RF deviation should be set approximately 75 KHz.
3. Input signal should be held at a level that will not produce limiting.
4. FM-Stereo Simulator connected across FM antenna terminals. Tune radio to 100 MHz. AFC on.

Step	19 KHz Subcarrier Level Set to—	Frequency Selector Set to—	Function Selector Set to—	Output Indicator Connected to	Adjust—	Adjust for—	Step
1	Set Radio Function Switch to "FM-Stereo"						1
2			Turn RV 201 fully clockwise.				2
3	2%	Set "19 KHz off/Normal/ Set 19 KHz Subcarrier Selector Switch to— Set 19 KHz Subcarrier	Stereo Left	Term 1 of T203	T202 (19 KHz trans)	Maximum (Stereo indicator light should be ON.)	3
					T203 (38 KHz trans)		
4	Zero				Turn RV201 fully counterclockwise (Indicator light should go OFF)		4
5	5%				RV 201	Adjust clockwise until indicator light just comes ON.	5
6	10%	1000 Hz		Junction of C221 & R224	T202	Minimum and correct Phase	6
7			Stereo Right	Junction of C220 & R223			7
8	Repeat steps 6 & 7 to obtain equal minimums.						8



Dial Cord

LUBRICATION

This mechanism has been lubricated at the factory and, with normal use, additional lubrication should not be necessary more often than every 6 months. When necessary to relubricate, first, remove all of the excess lubrication that surrounds the part. Apply specified lubricant as indicated.

1. One drop of Singer sewing machine oil (or equivalent) on bearing surfaces of pressure roller shaft (13) and capstan shaft (271).
2. Thin coat of Cosmolube #1 (or equivalent) to all metal sliding surfaces.

DO NOT OVER LUBRICATE. Over lubrication can be detrimental to proper operation.

PRESSURE ROLLER ADJUSTMENT

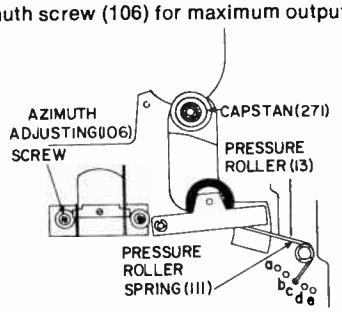
With unit in play position, use spring scale to adjust pressure roller (13) for 20 oz. ± 2 oz. Increase pressure by moving spring (111) anchor point to hole A or B. Decrease pressure by moving to hole D or E.

CLEANING

Periodic cleaning is necessary to insure continuous excellent performance of tape mechanism. Tape residue must not be permitted to accumulate on erase and record/play heads, pressure roller and capstan. A soft cloth, or cotton swab, moistened with alcohol may be used to carefully clean these surfaces.

AZIMUTH ADJUSTMENT

1. Connect VTVM across right channel output.
2. Load instrument with RCA test cassette tape 1-102 (or equivalent 6 to 8 KHz azimuth test tape).
3. Adjust azimuth screw (106) for maximum output.



SEMICONDUCTORS

ITEM	PART NO.	TYPE
CR1	59395	1N34A
CR2	59395	1N34A
CR3	166922	HR5A
CR4	123804	1S310
CR51	166593	V0-6C
CR52	166593	V0-6C
CR53	166985	AW01-13
CR54	166593	V0-6C
CR55	166593	V0-6C
CR101	117730	1N60
CR103	123276	1S85WT
CR104	117730	1N60
CR105	117730	1N60
CR106	59395	1N34A
CR107	117730	1N60P
CR108	117730	1N60P
CR110	117730	1N60
CR111	59395	1N34A
CR201	59395	1N34A
CR202	59395	1N34A
CR203	117730	1N60P
CR204	117730	1N60P
CR205	117730	1N60P
CR206	117730	1N60P
Q1	125389	2SC458B
Q101	125995	2SC535B
Q102	129392	2SC535A
Q103	129392	2SC535A
Q104	129394	2SC460B
Q105	129394	2SC460B
Q106	129394	2SC460B
Q107	129394	2SC460B
Q108	125390	2SC460C
Q201	125389	2SC458B
Q202	125389	2SC458A
Q203	125389	2SC458B
Q204	125389	2SC458C
Q301	127355	2SC458CLG
Q302	127355	2SC458CLG
Q303	125389	2SC458B
Q304	167285	2SB367BP
Q305	167285	2SB367BP
TR1	127355	2SC458CLG
TR2	127355	2SC458CLG
TR3	125389	2SC458A
TR4	125389	2SC458A
TR5	167263	2SC458D
TR6	127355	2SC458CLG
TR7	127355	2SC458CLG
TR8	125389	2SC458A
TR9	125389	2SC458A
TR10	167263	2SC458D
TR11	122244	2SB77CP
TR12	122244	2SB77CP
TR13	122244	2SB77CP
TR14	123877	2SB370A
VR101	125458	HV-23
VR102	125458	HV-23
VR201	125458	HV-23

ELECTROLYTIC/VARIABLE CAPS

ITEM	PART NO.	DESCRIPTION	
(RADIO CHASSIS)			
C002	126917	3.3mfd	16V
C004	126917	3.3mfd	16V
C009	128829	100mfd	15V
C010	165362	2000mfd	25V
C031	127042	2000mfd	25V
C053	127042	2000mfd	25V
C054	165721	47mfd	16V
C142	126917	3.3mfd	16V
C152	126917	3.3mfd	16V
C157	127477	220mfd	10V
C172	128185	47mfd	6.3V
C203	126917	3.3mfd	16V
C204	165722	10mfd	16V
C206	126917	3.3mfd	16V
C207	126441	470mfd	16V
C210	128185	47mfd	6.3V
C304	129300	220mfd	6.3V
C308	127474	470mfd	16V
C309	128185	47mfd	6.3V
C310	165441	470mfd	25V
CT101, CT102, CT104, CT105, CV101, CV102, CV103, CV104, CV105	165340	Tuning Gang w/Trimmers	
(TAPE CHASSIS)			
C3	126917	3.3mfd	16V
C6	126933	33mfd	6.3V
C7	126917	3.3mfd	16V
C8	127097	100mfd	16V
C9	126917	3.3mfd	16V
C12	165441	470mfd	25V
C13	165722	10mfd	16V
C16	165441	470mfd	25V
C17	165722	10mfd	16V
C18	129296	1mfd	50V
C103	126917	3.3mfd	16V
C106	126933	33mfd	6.3V
C107	126917	3.3mfd	16V
C108	127097	100mfd	16V
C109	126917	3.3mfd	16V
C112	165441	470mfd	25V
C113	165722	10mfd	16V
C116	165441	470mfd	25V
C117	165722	10mfd	16V
C118	129296	1mfd	50V
C201	165721	47mfd	16V
C206	165441	470mfd	25V
C207	165441	470mfd	25V
C208	126173	100mfd	25V
C209	165723	47mfd	25V
C210	126173	100mfd	25V

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
R015	167722	250K Dual Treble
R016	167723	100K Bass
R017	167724	500K Dual Loudness/Switch
R018	167725	250K Balance
RV101	127179	1000 ohms Bias
RV201	165732	5000 ohms MPX Indicator
TH301	127186	Thermistor, 13D-27
TH302	127186	Thermistor, 13D-27
VR1	167727	10K Record Volume
VR2	167248	5000 ohms Playback Level
VR3	167249	5000 ohms Output Level
VR4	167728	100K Bias Level
VR5	167727	10K Record Volume
VR6	167248	5000 ohms Playback Level
VR7	167728	100K Bias Level

COILS/TRANSFORMERS

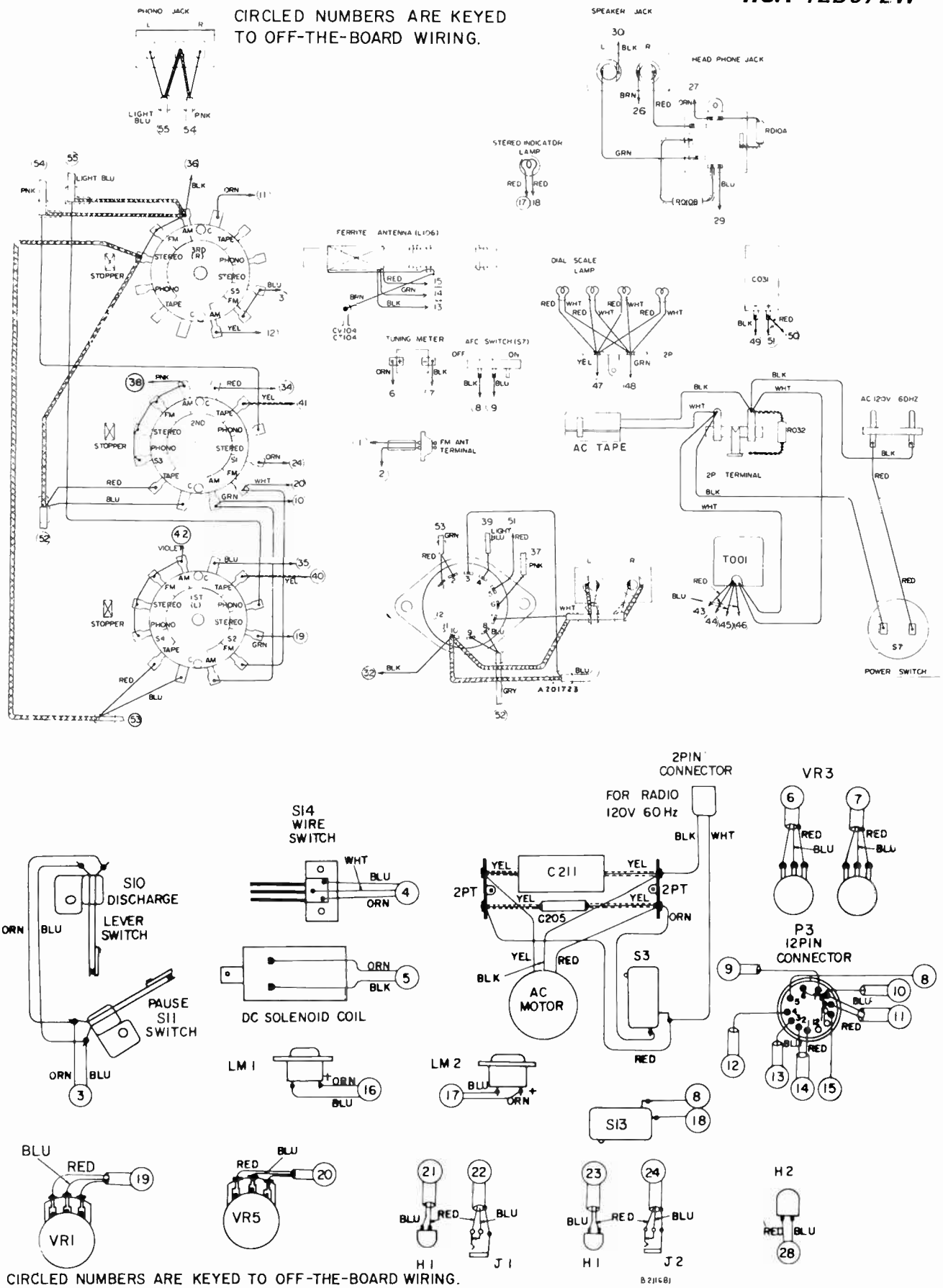
ITEM	PART NO.	ITEM	PART NO.
(RADIO CHASSIS)			
L101	123292	T104	125394
L102	127174	T105	127192
L103	127173	T106	125394
L104	123292	T107	125465
L105	125454	T108	123281
L106	167016	T109	125394
L107	123289	T110	165659
L108	165744	T111	165657
L109	165744	T112	165656
L110	165744	T201	127191
L201	167014	T202	127188
L202	167014	T203	127187
T001	166870	T301	123810
T101	125404		
T102	127190	(TAPE CHASSIS)	
T103	123283		
		T1	123850

MISCELLANEOUS

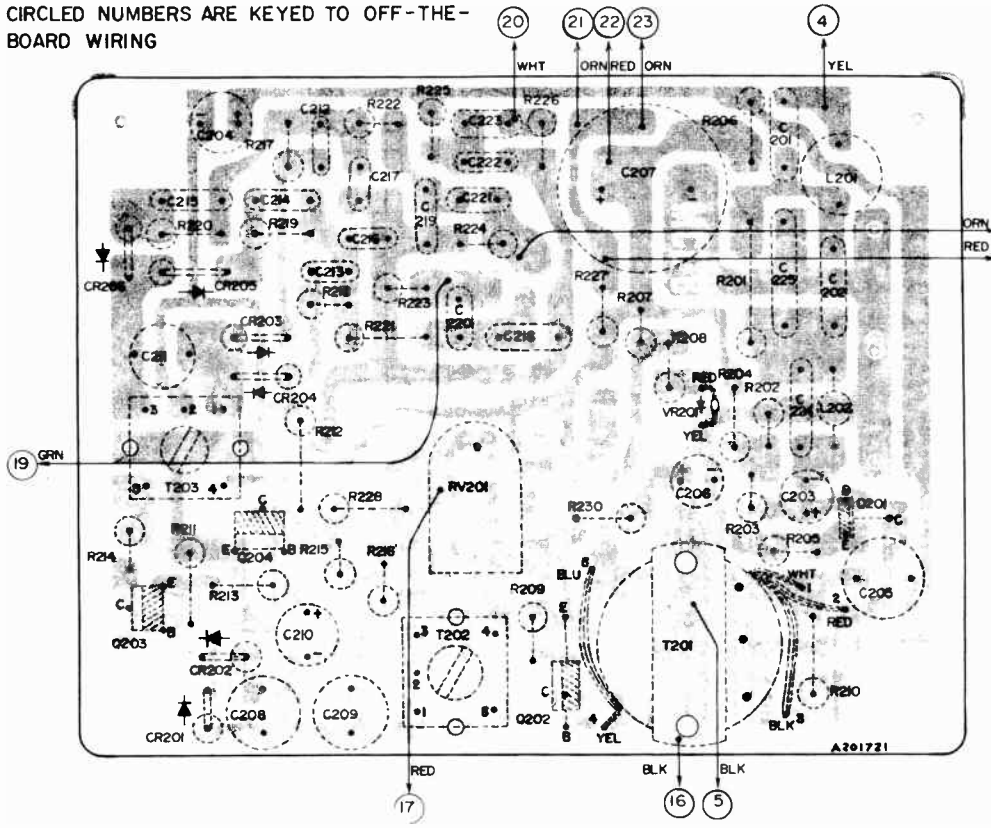
ITEM	NAME	PART NO.
(RADIO CHASSIS)		
S1, S2, S3, S4, S5	Switch, Function	167038
S6	Switch, AFC	123713
	Speaker, 2", 8 ohm	165717
	Speaker, 8", 8 ohm	166984
	Indicator, Tuning	167716
(TAPE CHASSIS)		
LM1	Meter, Level	167802
LM2	Meter, Level	167802
H1	Head, Record/Play	167874
H2	Head, Erase	167875
S8	Switch, Record/Play	167877
S9	Switch, Record/Play	167877
S10	Switch, Discharge	167758
S11	Switch, Pause	167758
S12	Switch, Motor	123694
S13	Switch, DC Source	123694
S14	Switch, Auto Reject	167787
	Solenoid, Track Change	167741
	Motor, Drive	167789
	Belt, Drive	167796

CABINET PARTS

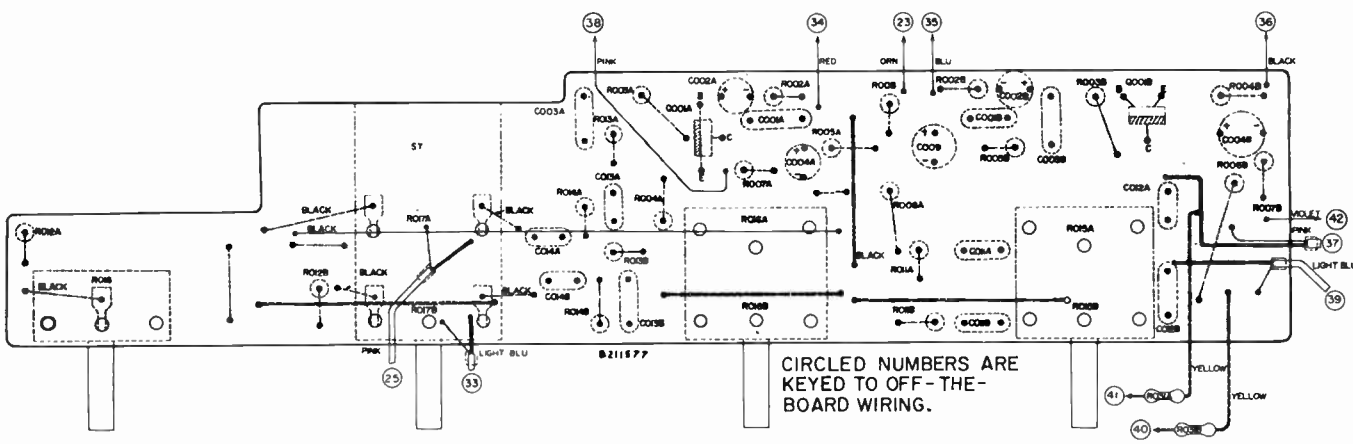
NAME	PART NO.
Back, Cabinet	167711
Button, Eject	167714
Cabinet, Main	167710
Knob, Tuning	165755
Knob, Loudness	165756
Panel, Front	167720



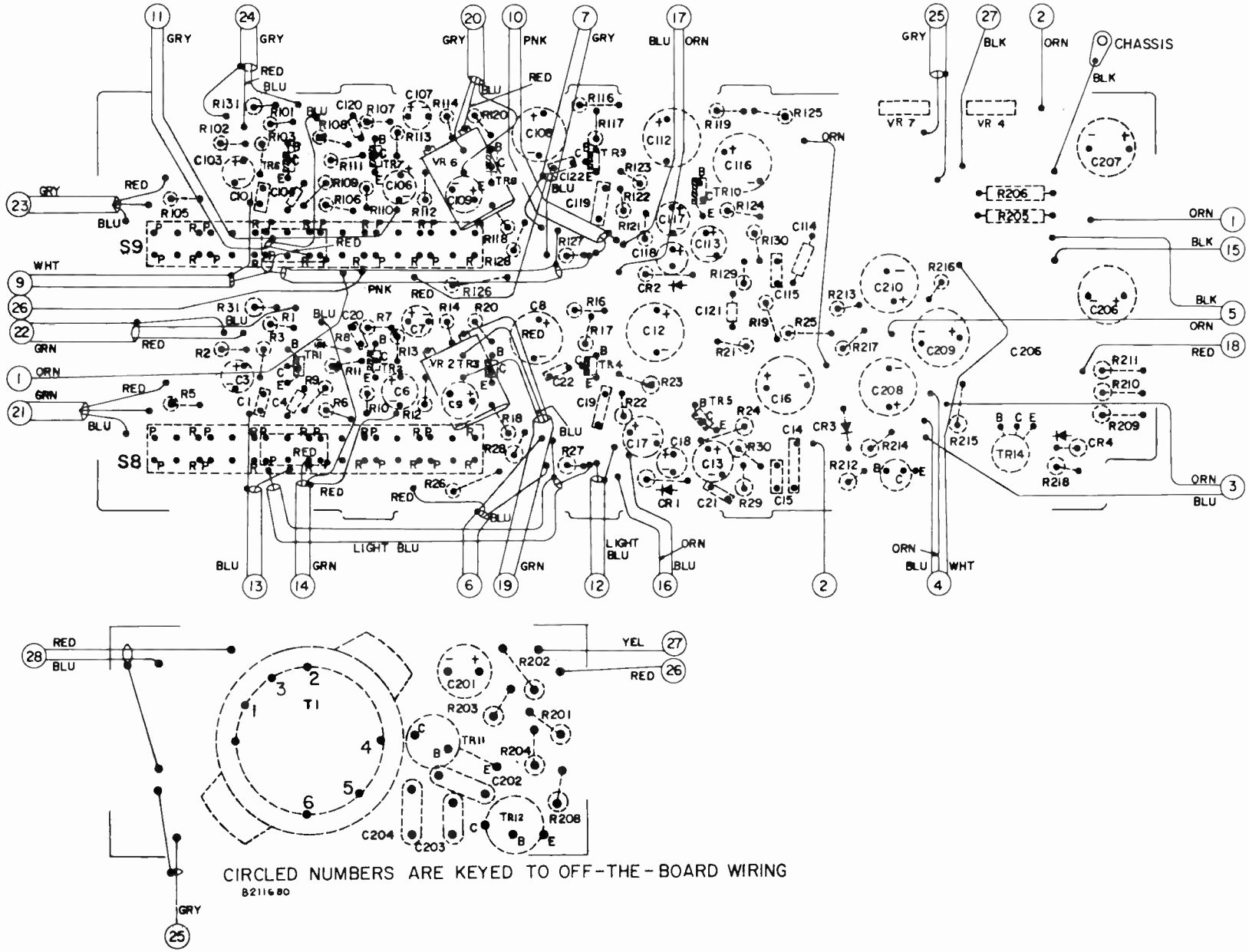
Instrument Wiring



MPX Block—Component Location (Wiring View)

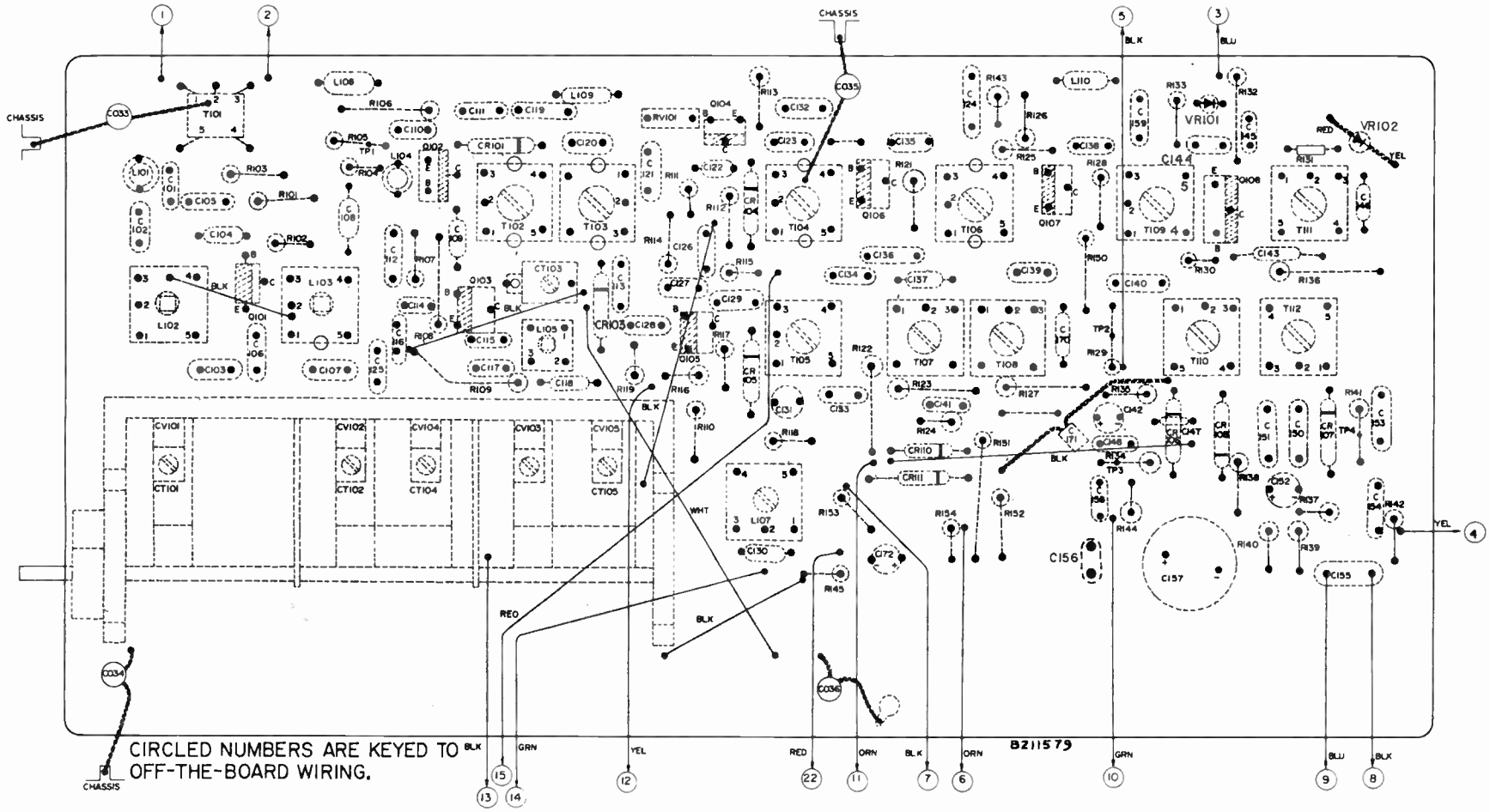


Tone Block—Component Location (Wiring View)



CIRCLED NUMBERS ARE KEYED TO OFF-THE-BOARD WIRING

B211680



Q101 2SC535(B) FM RF AMP. | Q103 2SC535(A) FM OSC. | Q102 2SC535(A) FM MIX. | CR101 IN60 FM LIMIT. | CR103 IS85 FM AFC. | Q104 2SC460(B) FM IF AMP. | CR104 IN60 FM LIMIT. | Q105 2SC460(B) AM CONV. | Q106 2SC460(B) FM/AM IF AMP. | CR105 IN60 AM AGC | Q107 2SC460(B) FM/AM IF AMP. | CR106 IN34A AM DET. | Q108 2SC460(B) FM IF AMP. | VR101,102 HV23X2 VOLTAGE STAB. | CR107,108 IN60(P)X2 RATIO DET | CR111 IN34A AM DET. | CR110 IN60 FM DET.

NOTES
ALL RESISTANCE IS VALUED IN "OHM" K=1000 OHM.
ALL CAPACITANCE IS VALUED IN "FARAD."
FUNCTION SWITCH IS SHOWN IN "AM" POSITION.
NUMERALS SHOWN IN ( ) INDICATE VOLTAGES WITH FUNCTION SWITCH IN "FM" AND "FM STEREO" POSITION.
VOLTAGES MEASURED WITH "VOLTOHMYST" AT AC 120 V LINE. LOUDNESS CONTROL MINIMUM AND NO SIGNAL.

TH302A,B 13D27X2 TEMP. COMP.

TH301A,B 13D27X2 TEMP. COMP.

Q301A,B 2SC458(C)LGX2 AF AMP

Q303A,B 2SC458(B)X2 AF-AMP

Q305A,B 2SB367(B)PX2 POWER AMP

Q001A,B 2SC458(B)LGX2 PRE-AMP

Q302A,B 2SC458(B)LGX2 AF-AMP

Q304A,B 2SB367(B)PX2 POWER AMP.

FM/AM RF & IF BLOCK

FM MPX. BLOCK

AF BLOCK

Q201 VR201 Q202 CR201,202
2SC458(B) HV-23 2SC458(A) IN34AX2
19KHz AMP. VOLT. STAB. 19KHz AMP. DOUBLER

Q203 2SC458(B) 38KHz AMP.

Q204 2SC458(C) DC AMP.

CR203~206 IN60(P)X4 SWITCHING

CR101 CR104,105 CR107,108 CR110 CR201~208

VR101,102 VR201

CR053 AW01-13 VOLT. STAB

CR051,052 054,055

Q001A,B Q101~108 Q201~204 Q301A,B Q303A,B

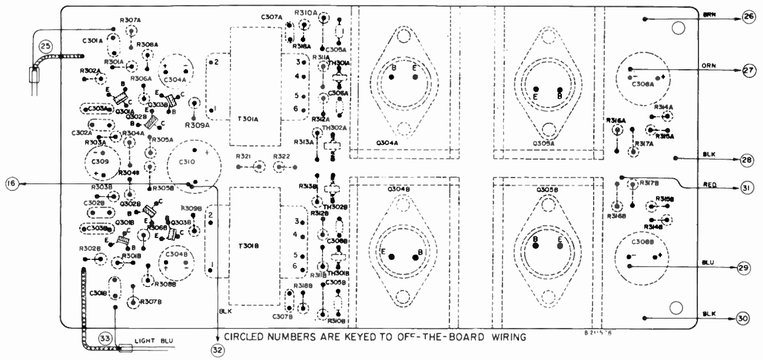
Q304A,B Q305A,B BOTTOM VIEW

T105 POINT YELLOW

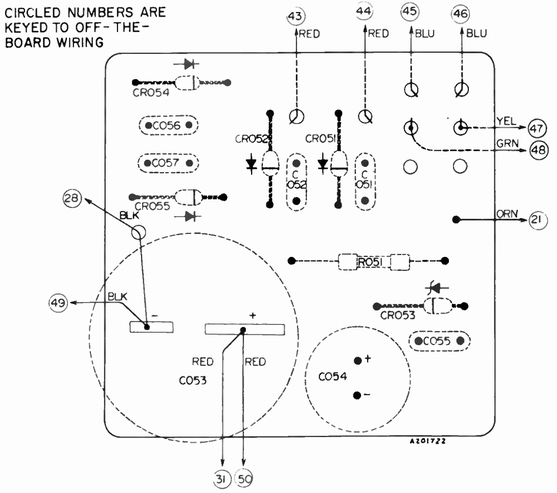
T202,203 T102~112

CR051, 052, CR054, 055
VO-6CX4, RECTIFIER

Radio Schematic—Model YZD 572

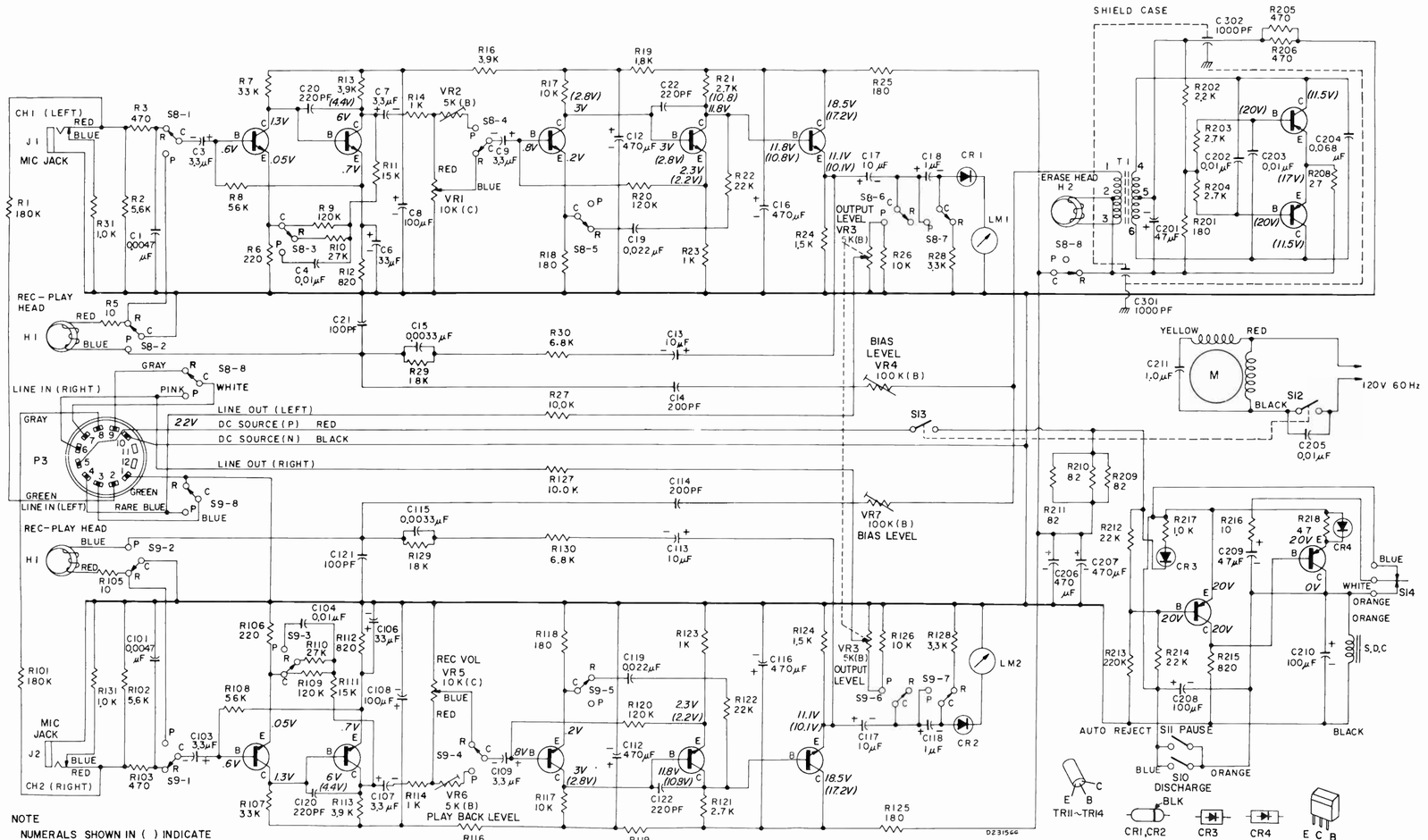


AF Output Block—Component Location (Wiring View)



Power Block—Component Location (Wiring View)

TR1 2SC458LG(C) PRE AMP
TR2 2SC458LG(C) PRE AMP
TR3 2SC458(A) PRE AMP
TR4 2SC458(A) PRE AMP
TR5 2SC458(D) PRE AMP
CR 1 1N34A DET
TR 11,12 2SB77(CP)X2 BIAS OSC

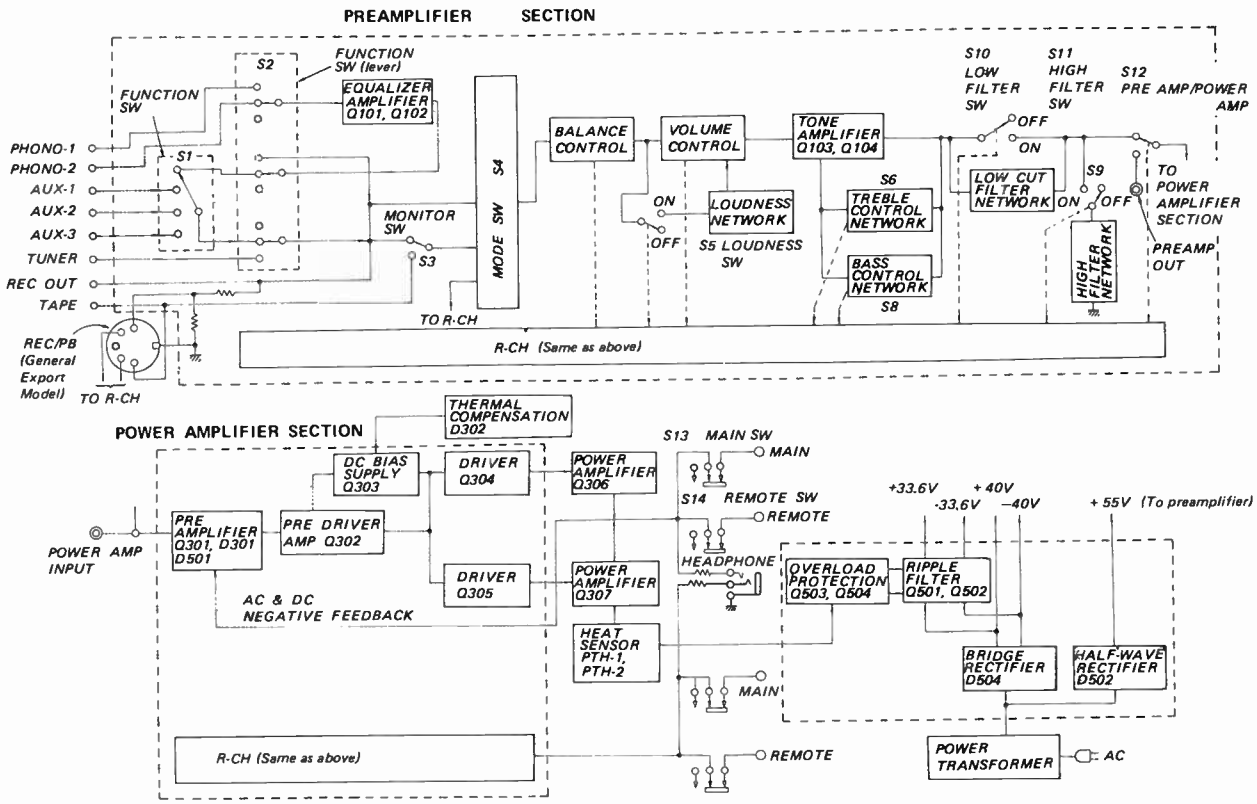


NOTE
NUMERALS SHOWN IN ( ) INDICATE VOLTAGES WITH RECORDER SWITCH IN RECORDING POSITION.

TR6 2SC458LG(C) PRE AMP
TR7 2SC458LG(C) PRE AMP
TR8 2SC458(A) PRE AMP
TR9 2SC458(A) PRE AMP
TR10 2SC458(D) PRE AMP
CR 2 1N34A DET
CR 3 HR-5A REPEAT STOP RECT
TR13 2SB77C(PP) AUTO REJ
TR14 2SB370A(A) AUTO REJ
CR 4 1S310 REPEAT STOP RECT

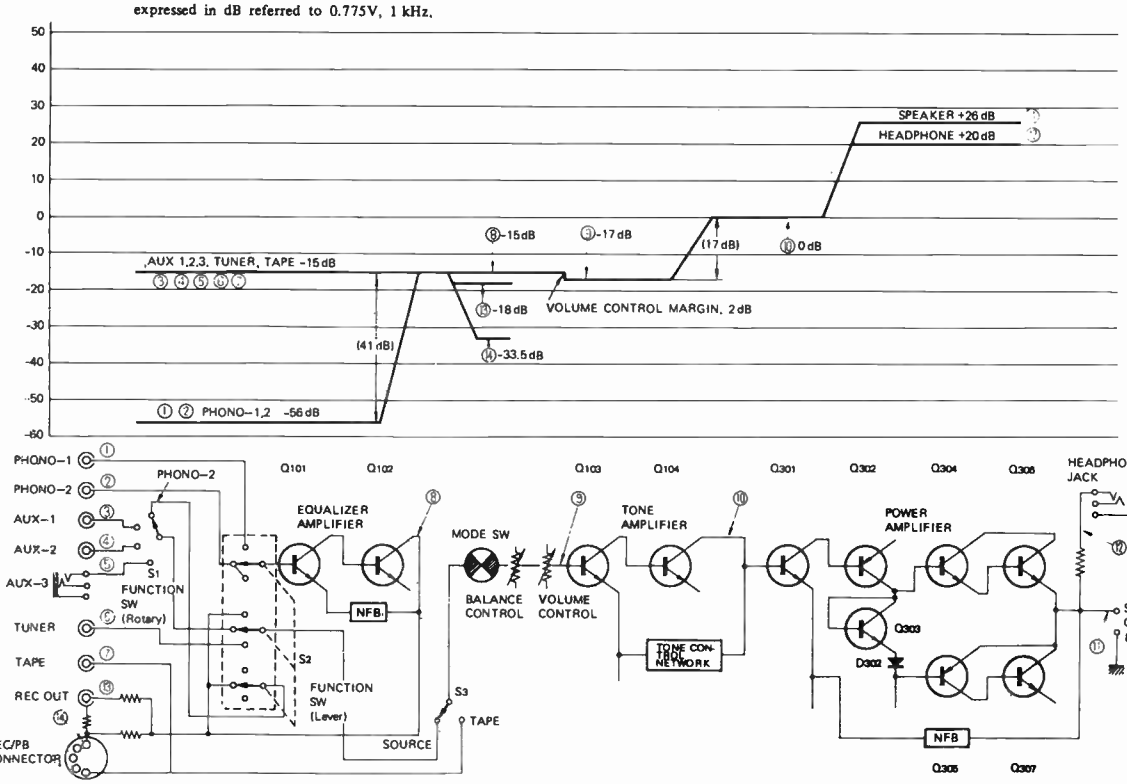
Schematic Diagram—Tape Unit

Pages 117-126 Courtesy of SONY CORP. OF AMERICA



BLOCK DIAGRAM

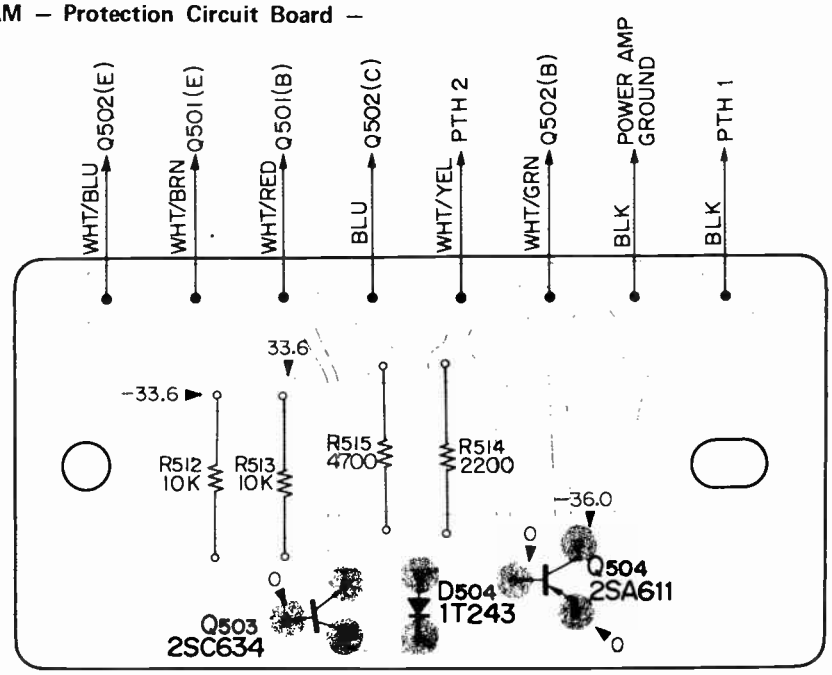
Note: Signal voltages are measured with VTVM and expressed in dB referred to 0.775V, 1 kHz.



LEVEL DIAGRAM

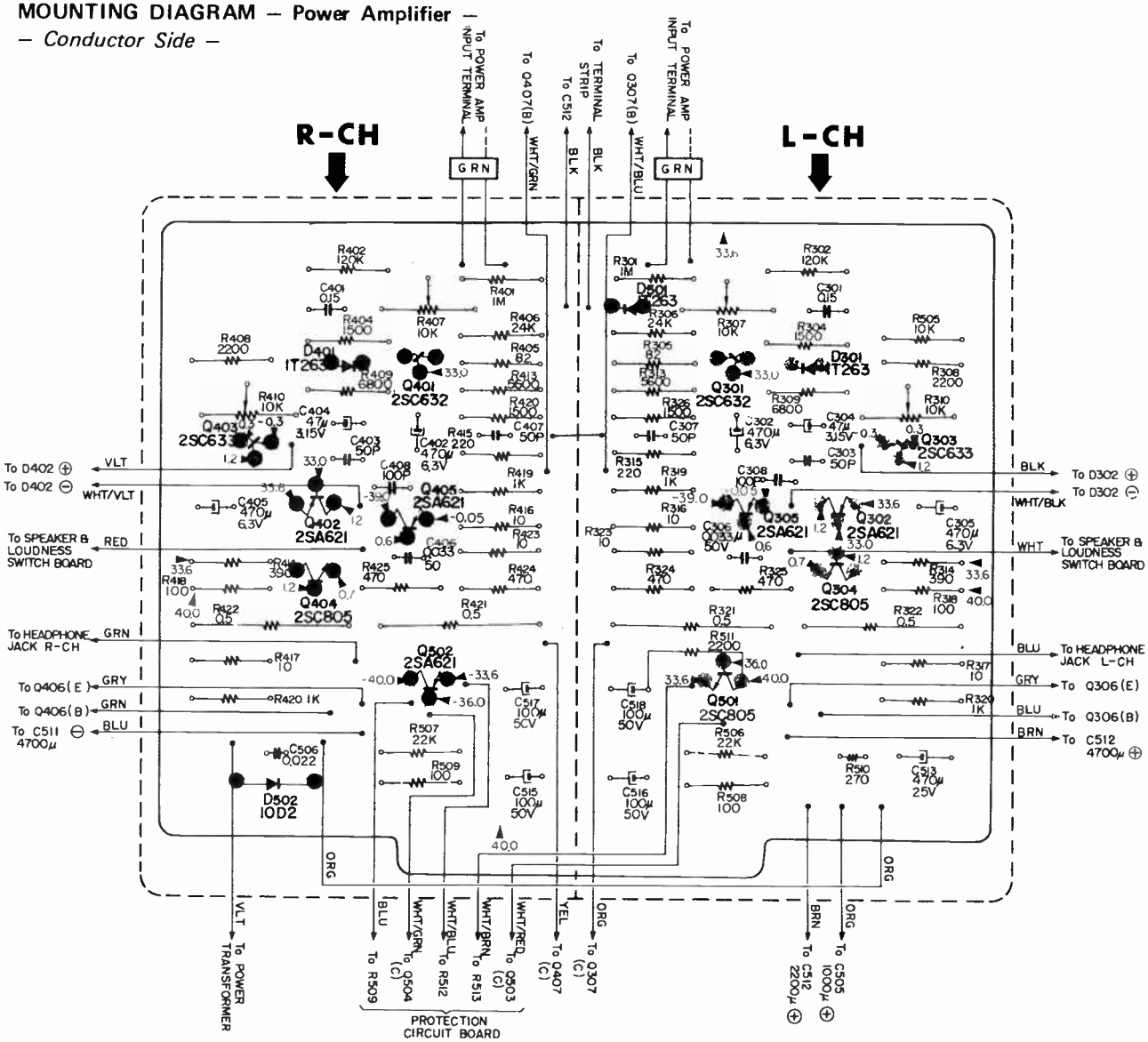
MOUNTING DIAGRAM – Protection Circuit Board –

– Conductor Side –

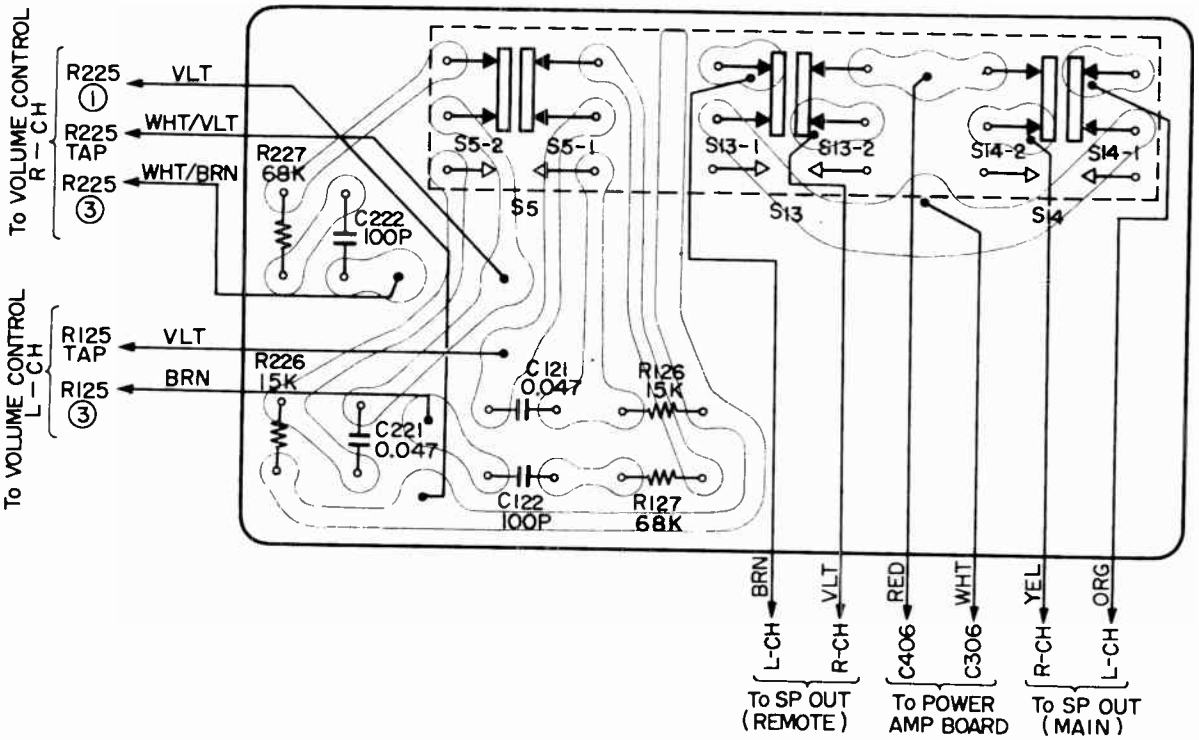


MOUNTING DIAGRAM – Power Amplifier –

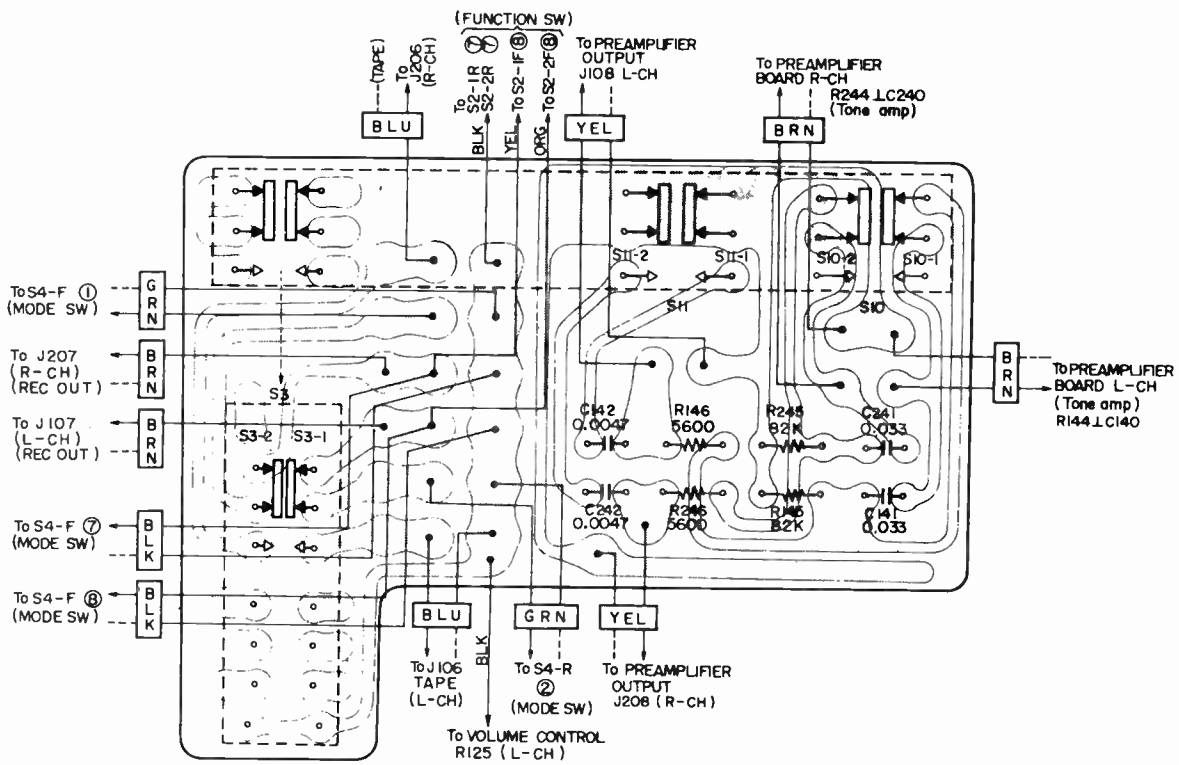
– Conductor Side –



MOUNTING DIAGRAM — Speaker, Loudness Switch Board —
— Conductor Side —

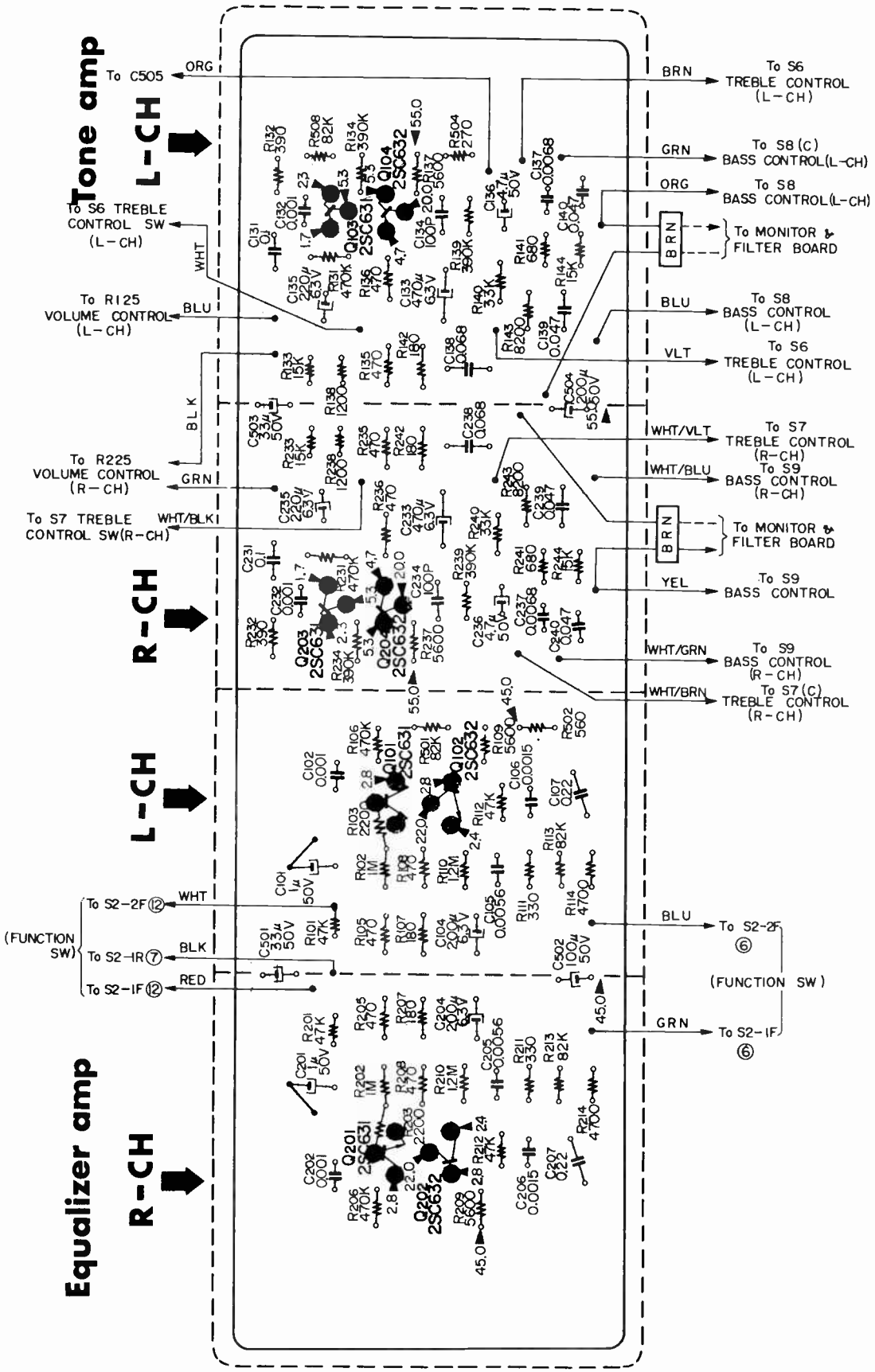


MOUNTING DIAGRAM — Filter, Monitor Switch Board —
— Conductor Side —



MOUNTING DIAGRAM – Preamplifier Section –

– Conductor Side –



ADJUSTMENT

Note: There are two adjustments in the power amplifier, a dc-bias adjustment and an ac-balance adjustment. These adjustments should be alternately repeated two or three times after replacing any of the power transistors until the best operation is obtained.

3-1. DC BIAS ADJUSTMENT

Serious deficiencies in performance, such as thermal runaway of power transistors, will result if this adjustment is improperly set.

CAUTION

To avoid accidental power transistor damage, increase the ac line voltage gradually (using a variable transformer) while measuring the voltage across emitter resistors R321 and R322 (or R421 and R422) as shown in Fig. 3-1. Check to see that the reading does not exceed 50 mV. If it does, turn off the power immediately, then check and repair the trouble in the power-amplifier board.

Test Equipment Required

1. Dc millivoltmeter
2. Variable transformer
3. Screwdriver with 3 mm (⅛") blade

Preparation

1. Remove the top cover
2. Connect the dc millivoltmeter between R321 and R322 (R421 and R422) as shown in Fig. 3-1.

Procedure

1. Apply a drop of cement solvent to the semi-fixed resistors (Fig. 3-1).
2. Set the semifixed resistors as follows:

   R310 (L-CH, dc bias)..... fully counterclockwise
   R410 (R-CH, dc bias).... fully clockwise
   R307, R407 (ac balance)
   ..... midposition
2. Set the variable transformer for minimum output.
3. Turn the POWER switch, then increase the line voltage up to the rated value.
4. Apply a drop of cement solvent to R310 (R410) then wait a few seconds for the cement to dissolve.

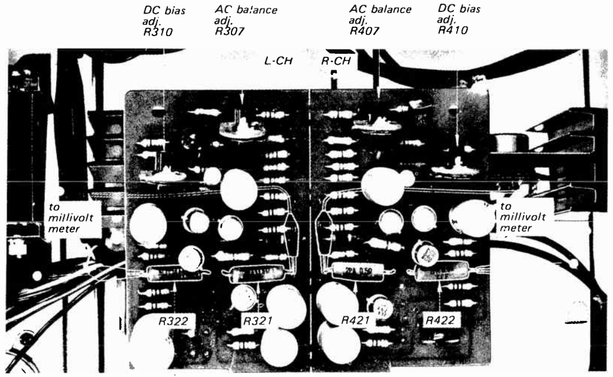


Fig. 3-1 Power amplifier adjustment

5. Adjust R310 (R410) to obtain a 50 mV reading on the meter.

3-2. AC BALANCE ADJUSTMENT

Excessive harmonic distortion at high levels will result if this adjustment is improperly set.

Test Equipment Required

1. Dc null meter or dc millivoltmeter
2. Screwdriver, with 3 mm (⅛") blade

Preparation

1. Remove the top cover
2. Set the SPEAKER switch to MAIN.
3. Connect the dc null meter or dc millivoltmeter to the MAIN speaker output terminal.

Procedure

1. Apply a drop of cement solvent to R307 (R407) and wait a few seconds for the lock paint to dissolve.
2. Turn the POWER switch to ON, and then adjust R307 (R407) to obtain a 0V reading on the meter.
3. After 10 minutes warm-up, alternately repeat this and the dc bias adjustment two or three times.
4. After completing the adjustment, apply a drop of lock paint to R310 and R307 (R410 and R407).

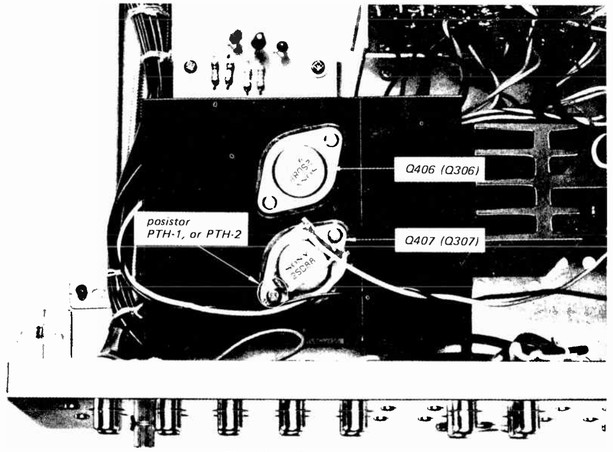


Fig. 3-2 Parts location

SEMICONDUCTORS

ITEM	PART NO./TYPE
D301	1T263
D302	SV31
D401	1T263
D402	SV31
D501	1T263
D502	10D2
D503	5B4
D504	1T243M
Q101	2SC631
Q102	2SC632
Q103	2SC631
Q104	2SC632
Q201	2SC631
Q202	2SC632
Q203	2SC631
Q204	2SC632
Q301	2SC632
Q302	2SA621
Q303	2SC633
Q304	2SC805
Q305	2SA621
Q306	2SD88
Q307	2SD88
Q401	2SC632
Q402	2SA621
Q403	2SC633
Q404	2SC805
Q405	2SA621
Q406	2SD88
Q407	2SD88
Q501	2SC805
Q502	2SA621
Q503	2SC634
Q504	2SA611

ELECTROLYTIC CAPS

ITEM	PART NO.	VALUE
C101	1-121-343	1mfd 50V
C104	1-121-295	220mfd 6.3V
C133	1-121-359	470mfd 6.3V
C135	1-121-295	220mfd 6.3V
C136	1-121-346	4.7mfd 50V
C201	1-121-343	1mfd 50V
C204	1-121-295	220mfd 6.3V
C233	1-121-359	470mfd 6.3V
C235	1-121-295	220mfd 6.3V
C236	1-121-346	4.7mfd 50V
C302	1-121-359	470mfd 6.3V
C304	1-121-287	47mfd 3.15V
C305	1-121-359	470mfd 6.3V
C402	1-121-359	470mfd 6.3V
C404	1-121-287	47mfd 3.15V
C405	1-121-359	470mfd 6.3V
C501	1-121-351	33mfd 50V
C502	1-121-384	100mfd 50V
C503	1-121-351	33mfd 50V
C504	1-121-385	220mfd 50V
C505	1-121-330	1000mfd 60V
C511	1-121-800	4700mfd 50V
C512	1-121-800	470mfd 25V
C513	1-121-234	470mfd 25V
C515	1-121-384	100mfd 50V
C516	1-121-384	100mfd 50V
C517	1-121-384	100mfd 50V
C518	1-121-384	100mfd 50V

CONTROLS/SPECIAL RESISTORS

ITEM	PART NO.	DESCRIPTION
PTH1	1-800-064	Posistor, SB-26
PTH2	1-800-064	Posistor, SB-26
R124 & R224	1-222-273	250K Dual Balance
R125 & R225	1-222-274	250K Dual Volume
R307	1-221-967	10K AC Balance
R310	1-221-967	10K DC Bias
R321	1-207-151	.5 ohms 10% 1.5W WW
R322	1-207-151	.5 ohms 10% 1.5W WW
R407	1-221-967	10K AC Balance
R410	1-221-967	10K DC Bias
R421	1-207-151	.5 ohms 10% 1.5W WW
R422	1-207-151	.5 ohms 10% 1.5W WW

COILS/TRANSFORMERS

ITEM	PART NO.
Power	1-441-564-14

MISCELLANEOUS

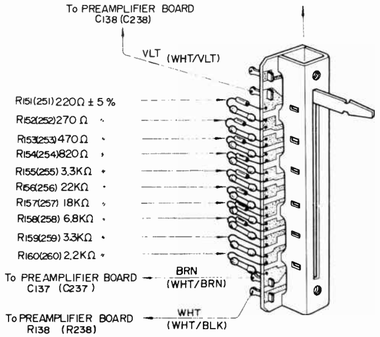
ITEM	NAME	PART NO.
CP	Component Combination	1-231-057-12
S1	Switch, Function 1	1-514-601
S2	Switch, Function 2	1-514-600
S3	Switch, Monitor	1-514-598
S4	Switch, Mode	1-514-508
S5	Switch, Loudness	1-514-604
S6	Switch, Left Treble	1-514-637
S7	Switch, Right Treble	1-514-637
S8	Switch, Left Bass	1-514-637
S9	Switch, Right Bass	1-514-637
S10	Switch, Low Filter	1-514-602
S11	Switch, High Filter	1-514-602
S12	Switch, Preamp/Power Amp	1-514-524
S13	Switch, Remote Speakers	1-514-604
S14	Switch, Main Speakers	1-514-604
S15	Switch, Power (General Export)	1-514-599-12
S15	Switch, Power (USA, Canada)	1-514-599-22
	Fuse, (USA, Canada)	1-532-214
	Fuse, (General Export)	1-532-255
	P.C. Board, Filter/Monitor	98-2555-01
	P.C. Board, Speaker/Loudness	98-2555-02
	P.C. Board, Treble	98-2555-03
	P.C. Board, Bass	98-2555-04
	P.C. Board, Preamp	98-2555-21
	P.C. Board, Power Amp	98-2555-22
	P.C. Board, Protection	X-20680-27

CABINET PARTS

NAME	PART NO.
Cover, Top	2-068-015
Panel, Front	2-068-010
Knob, Mode	2-068-306
Knob, Power	2-068-018
Knob, Function 1	2-068-306
Knob, Function 2	2-068-018
Knob, Volume	2-068-307

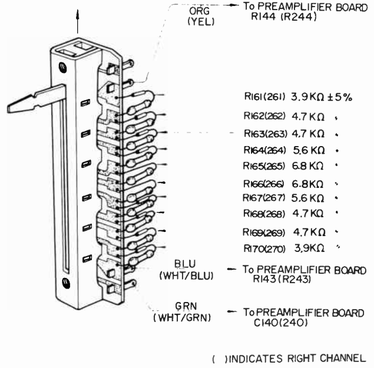
MOUNTING DIAGRAM — Tone Control Switch —

— Treble Control —

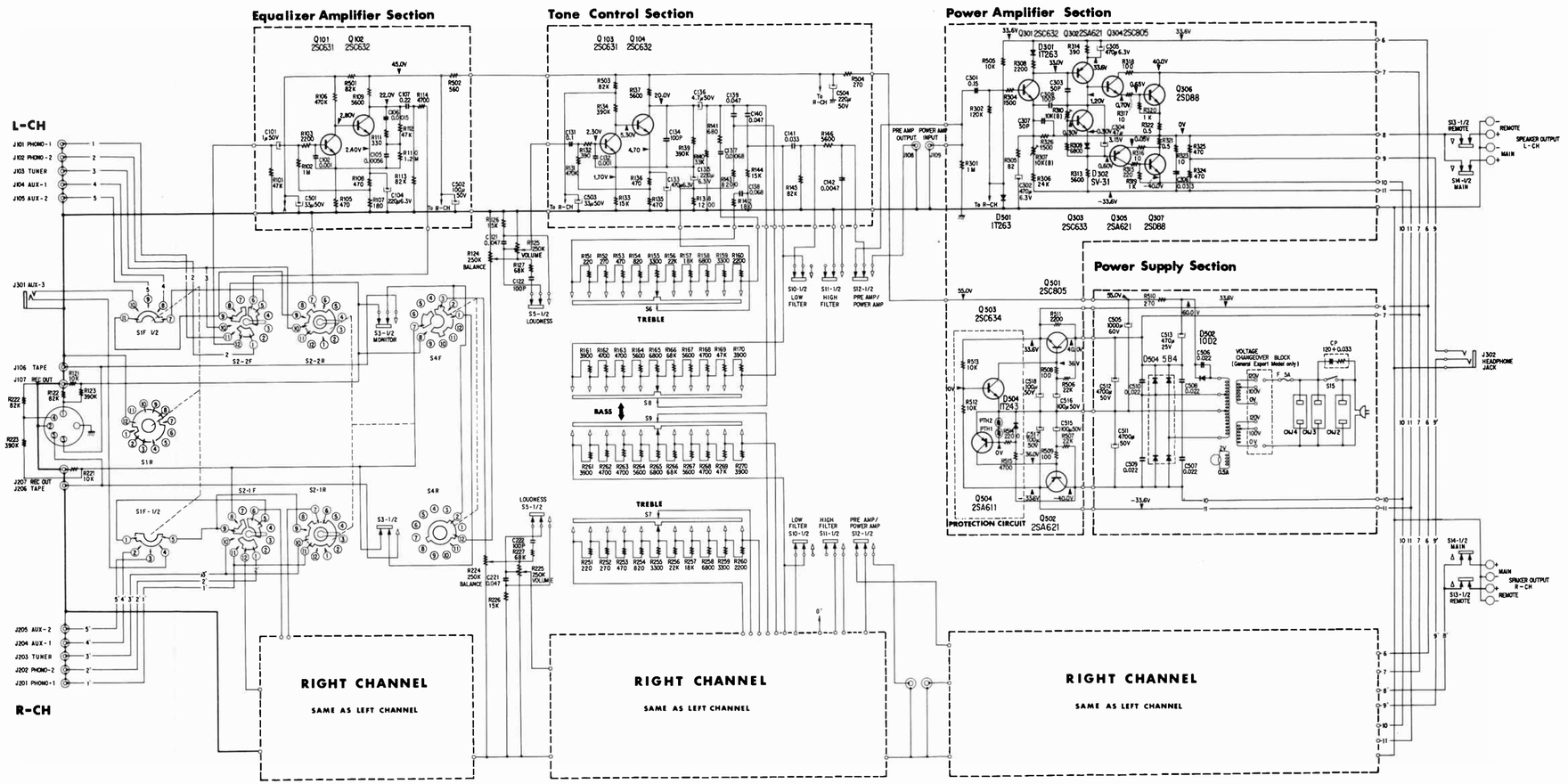


( )INDICATES RIGHT CHANNEL

— Bass Control —

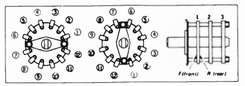


( )INDICATES RIGHT CHANNEL

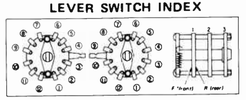


Symbol	Description	Position
S1	FUNCTION (1) [PHONO(2)-AUX(1)-AUX(2)-AUX(3)]	PHONO-2
S2	FUNCTION (2) [TUNER-FUNCTION(1)-PHONO(1)]	FUNCTION (1)
S3	MONITOR SW (TAPE-SOURCE)	SOURCE
S4	MODE SW (REVERSE-STEREO-"L+R"-"L"-"R")	STEREO
S5	LOUDNESS SW	ON
S6	TREBLE CONTROL (L-CH)	0 dB
S7	TREBLE CONTROL(R-CH)	0 dB
S8	BASS CONTROL(L-CH)	0 dB
S9	BASS CONTROL(R-CH)	0 dB
S10	LOW FILTER SW	OFF
S11	HIGH FILTER SW	OFF
S12	PRE/POWER AMP SW (NORMAL-SEPARATE)	NORMAL
S13	REMOTE SPEAKER SW	ON
S14	MAIN SPEAKER SW	ON
S15	POWER SW	OFF

ROTARY SWITCH INDEX



LEVER SWITCH INDEX



2SC631
2SC632
2SC634

2SC805
2SA621

2SA611

2SD88

Note:
All resistance values are in ohms. k=1000, M=1000 k
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages represent an average value and should hold within ± 20%.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.

INDEX

This index lists all Compact, Component, and Modular Hi-Fi Equipment in "PHOTOFACT MODULAR HI-FI SERIES" and "SAMS MODULAR HI-FI COMPONENTS" volumes

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